Vol. 1010 Number 5

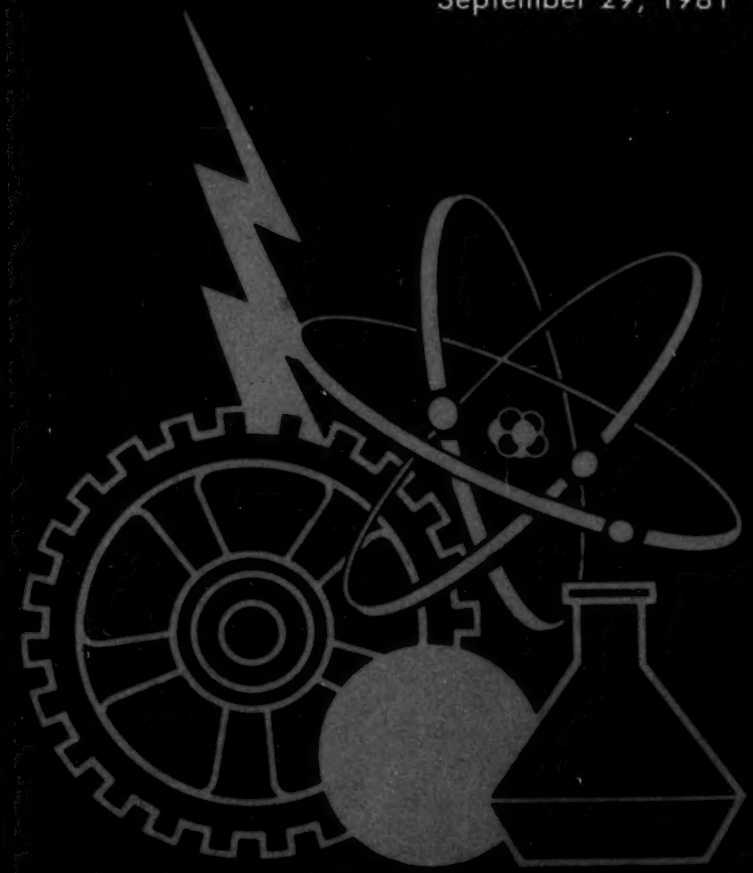
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 29, 1981



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

September 29, 1981 Volume 1010 Number 5

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly, subscription $325.00 per annum for first-class mailing, also available as fourth-class mail at $225.00 domestic; $281.25 foreign; foreign first-class mailing rates will be furnished upon request; single copies each, $5.50 domestic, $6.90 foreign.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Board of Appeals Decisions Rendered in the Month of Aug. 1981

Affirmed	179
Affirmed in Part	20
Reversed	63
Total	262

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,989,840, Re. S.N. 272,145, Filed June 10, 1981, Cl. 424/300, CONTROL OF ANIMAL PARASITES WITH RING-SUBSTITUTED N-(2,2-DIFLUORO-ALKANOYL)-O-PHENYLENEDIAMINES, George Oliver Plunkett O'Doherty, Owner of Record: *Eli Lilly and Co., Indianapolis, Ind.,* Attorney or Agent: Arthur R. Whale, et al., Ex. Gp.: 125

3,991,282, Re. S.N. 263,208, Filed May 13, 1981, Cl. 179/99, MULTI STATION TELEPHONE SWITCHING SYSTEM, Thomas E. Feil, Owner of Record: *Interconnect Planning Corp., New York, N.Y.,* Attorney or Agent: George B. Finnegan, Jr., et al., Ex. Gp.: 234

4,154,795, Re. S.N. 263,092, Filed May 12, 1981, Cl. 422/99, MICROTEST PLATES, Anthony C. Thorne, Owner of Record: *Dynotoch Holdings Ltd., St. Peters Port, Guernsey, Channel Island England,* Attorney or Agent: James E. Nolan, et al., Ex. Gp.: 177

4,165,288, Re. S.N. 262,812, Filed May 12, 1981, Cl. 210/23H, PROCESS OF TREATING WASTE WATER FROM A TEXTILE VAT DYEING OPERATION TO PRODUCE A CONCENTRATE FOR REUSE, Richard K. Teed, et al., Owner of Record: *Riegel Textile Corp., New York, N.Y.,* Attorney or Agent: Samuel G. Layton, Jr., et al., Ex. Gp.: 176

4,214,054, Re. S.N. 271,067, Filed June 8, 1981, Cl. 521/95, EXPANDED OLEFIN POLYMER, Seizaburo Watanabe, et al., Owner of Record: *Asahi-Dow Ltd., Tokyo, Japan,* Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 144

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

No Publications This Issue.

Vacancy Announcement
Chairman, Trademark Trial and Appeal Board

In accordance with the Senior Executive Service, the position of Chairman of the Trademark Trial and Appeal Board is being advertised. This appointment will be made at a salary of $50,113 per annum, which is the current statutory limit before awards and bonuses are distributed.

Persons interested in being considered for the vacancy, PTO-81-112, are invited to submit their applications to the address given below, on or before Sept. 30, 1981. Applications must be in the Office of Personnel by Sept. 30, 1981. The duties, qualifications, and factors which will be considered in evaluating the candidates are described below.

Duties: Serves as Chairman, Trademark Trial and Appeal Board. Manages the administrative functions of the Board and supervises the technical work of the Board. As a member of the TTAB, exercises original jurisdiction in *inter partes* proceedings and appellate jurisdiction of *ex parte* appeals. Renders written decisions representing the position of the PTO.

Qualifications: Evaluation of qualified candidates will be on the basis of education (self-development), awards, supervisory performance appraisals, managerial/executive qualifications and technical/professional qualifications. Candidates should address all these qualifications in their supplemental statements. Copies of the Qualification Standard are available in Crystal Plaza 2, Room 9C05.

Factors Which Will be Considered in Evaluating Qualified Candidates:

The six managerial/executive factors for SES positions are:

1. Integration of internal and external program policy issues;
2. Organization representation and liaison;
3. Direction and guidance of program, projects or policy development;
4. Resource acquisition and administration;
5. Utilization of human resources;
6. Review of implementation and results.

The technical/professional qualifications are:

1. Law degree and bar membership;
2. Professional legal experience which has provided a comprehensive knowledge of Appellate matters in Trademark law, rules of evidence, the Federal Rules of Civil Procedures, and general principles of ancillary legal subjects;
3. Demonstrated ability to express thoroughly, clearly and accurately the material facts, legal principles and

reasons for arriving at a stated conclusion by the application of law to the facts.

Employees of the Department of Commerce may apply by submitting a Merit Program Interest Statement (CD-261), OPM Form 1386, current performance appraisal, updated Personal Qualifications Statement (SF-171) and supplemental statement showing how the qualifications are met. Persons who are not employees of the Department of Commerce should submit a current performance appraisal, Personal Qualifications Statement (SF-171), OPM Form 1386, and supplemental statement. The completed forms should be sent to:

U.S. Patent and Trademark Office
Office of Personnel
Crystal Plaza 2, Room 9C05
2011 Jefferson Davis Hwy.
Arlington, Va. 22202

Questions concerning this notice should be directed to Ms. Marilyn Gannon, Office of Personnel, Room 2-9C05, Telephone (703) 557-3631.

MARGARET M. LAURENCE,
July 27, 1981. *Assistant Commissioner for Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of Sept. 29, 1981

Re. 30,627	4,243,079	4,257,987	4,269,748
3,856,802	4,243,187	4,258,089	4,269,775
4,012,725	4,244,047	4,258,154	4,269,861
4,016,906	4,244,182	4,259,004	4,269,889
4,017,540	4,244,870	4,259,308	4,270,771
4,067,891	4,244,910	4,260,102	4,271,143
4,079,083	4,244,912	4,260,459	4,271,224
4,092,261	4,244,965	4,260,868	4,271,362
4,122,109	4,245,539	4,261,799	4,271,583
4,123,463	4,245,823	4,261,887	4,271,665
4,128,725	4,246,488	4,262,115	4,271,789
4,131,738	4,247,198	4,262,185	4,272,055
4,136,250	4,247,462	4,262,656	4,272,180
4,167,511	4,247,758	4,262,820	4,273,621
4,174,651	4,249,065	4,263,196	4,273,636
4,185,626	4,249,324	4,263,842	4,273,778
4,197,046	4,250,569	4,263,931	4,274,681
4,197,942	4,251,585	4,264,169	4,274,845
4,199,082	4,251,761	4,264,188	4,275,206
4,207,071	4,252,410	4,264,285	4,275,437
4,208,187	4,252,415	4,264,368	4,275,495
4,212,811	4,252,528	4,264,626	4,275,646
4,214,805	4,252,754	4,265,322	4,276,130
4,224,338	4,253,160	4,265,329	4,276,218
4,224,640	4,253,361	4,265,382	4,276,435
4,226,941	4,253,523	4,265,531	4,276,467
4,228,368	4,253,894	4,265,783	4,276,636
4,231,753	4,253,944	4,265,895	4,276,688
4,231,768	4,254,220	4,266,127	4,276,749
4,232,008	4,254,267	4,266,172	4,276,768
4,232,035	4,254,365	4,266,416	4,276,867
4,234,702	4,255,041	4,266,561	4,276,921
4,234,957	4,255,211	4,266,965	4,277,499
4,235,255	4,255,381	4,267,234	4,277,547
4,236,892	4,255,476	4,268,027	4,277,836
4,237,111	4,255,740	4,268,340	4,278,054
4,237,274	4,255,862	4,268,383	4,278,233
4,237,955	4,255,939	4,268,499	4,278,358
4,238,334	4,256,164	4,268,549	4,278,583
4,238,414	4,256,300	4,268,594	4,279,103
4,238,559	4,256,622	4,268,683	4,280,241
4,240,673	4,256,859	4,269,173	4,280,257
4,240,720	4,256,894	4,269,397	4,280,469
4,242,458	4,257,237	4,269,714	4,281,278

Disclaimer

3,999,386.—*Stanley W. Crull* and *Donald J. Mac Intosh*, Ames, Iowa. OVERSPEED PROTECTION CONTROL FOR AN ENGINE. Patent dated Dec. 28, 1976. Disclaimer filed June 22, 1981, by the assignee, *Sundstrand Corp.*

Hereby enters this disclaimer to claim 3 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 25, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	4-29-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	6-25-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	7-11-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-03-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-07-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-03-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-31-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	6-08-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-28-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	11-01-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	2-06-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,139,622 to 3,142,840, inclusive

Plant Patents ..... Numbers 2,416 to 2,430, inclusive

REISSUES

SEPTEMBER 29, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,749

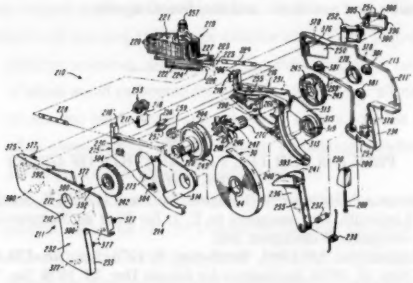
LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Original No. 3,968,745, dated Jul. 13, 1976, Ser. No. 312,454, Dec. 6, 1972. Continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. Application for reissue Dec. 17, 1979, Ser. No. 104,344

Int. Cl.³ B41J *1/20, 1/24*

U.S. Cl. 101—111 **30 Claims**



29. Printing apparatus, comprising: a print head including a body having a generally arcuate concave mounting surface, a post and a support, a plurality of wheels cradled in and rotatably supported at their outer peripheries on the generally arcuate mounting surface, a printing band in driven contact with each respective wheel and in supported contact with the support, a central hole in each wheel, the post being received in at least some of the holes, the holes being aligned to define a continuous opening through the wheels, and a selector slidably mounted around the post and shiftable into the hole of any wheel for selectively setting the selected printing band, the selector including a driving member selectably engageable with each wheel, and means located in the continuous opening defined by the wheel holes for detenting the selector in a selected position when the driving member is engaged with a selected wheel.

Re. 30,750

CARDIAC RESUSCITATOR AND MONITORING APPARATUS

Archibald W. Diack; Warren S. Welborn, both of Portland, and Robert G. Rullman, Beaverton, all of Oreg., assignors to Cardiac Resuscitator Corporation, Lake Oswego, Oreg.

Original No. 4,088,138, dated May 9, 1978, Ser. No. 645,074, Dec. 29, 1975. Continuation of Ser. No. 429,745, Jan. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 253,507, May 15, 1972, abandoned. Application for reissue May 7, 1980, Ser. No. 148,159

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 D **41 Claims**

22. A cardiac resuscitator apparatus comprising:

(a) an oro-pharyngeal airway for insertion into the pharynx of a patient, said airway having contact means mounted thereon for making electrical contact with tissue within the patient;

(b) second electrode means for external placement on the patient in the chest-abdominal region for making electrical contact with the patient in said region;

(c) circuit means for generating an electrical pacing pulse, said circuit means having first and second terminals between which said pacing pulse is supplied; and

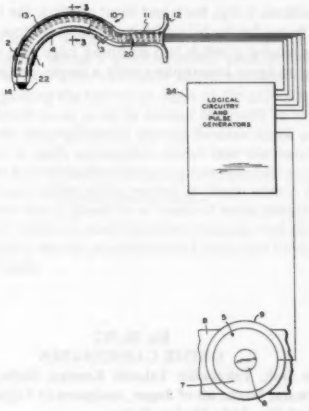
(d) conductor means respectively coupling said first and second terminals to said contact means and said second electrode means for delivering said pacing pulse to the patient through a current pathway in the trunk of the patient between said contact means mounted on said airway and said second electrode means for pacing the patient's heart.

38. A life sign monitoring system comprising:

(a) a tube adapted to be passed at least into the pharynx of a patient;

(b) contact means mounted on said tube;

(c) first means connected to said contact means for responding to electrical activity associated with the patient's heart;



(d) second means for sensing bodily movement of said patient, said second means comprising a sensor applied elsewhere to the body of the patient and responsive to chest expansion of the patient with respiration, said sensor comprising a strain gauge mounted upon means extending at least part way around the patient's chest comprising hinged tongs adapted to carry said strain gauge wherein said strain gauge is pressure-responsive and is disposed between said tongs and the patient's body; and

(e) logical means responsive to said first and said second means for indicating the presence of substantial electrical activity and whether bodily movement substantially accompanies said electrical activity.

Re. 30,751

TIDY BOX MADE ENTIRELY OF POLYPROPYLENE

Renato Castelli, Gent, Belgium, assignor to Samsonite Corporation, Denver, Colo.

Original No. 4,166,547, dated Sep. 4, 1979, Ser. No. 943,362, Sep. 18, 1978. Application for reissue Aug. 11, 1980, Ser. No. 177,718

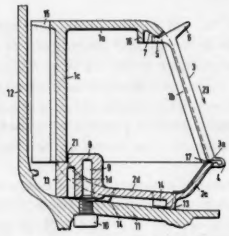
Claims priority, application Belgium, Sep. 30, 1977, 188333; Jun. 6, 1978, 188346

Int. Cl.³ B65D *43/14, 51/04, 1/24*

U.S. Cl. 220—339 **10 Claims**

1. A tidy box made entirely of polypropylene suitable for keeping small items, for example office requisites such as pencils, pens, rubbers, and pocket calculators, small samples and small toilet and dress requisites, said box consisting only of two parts fitted together after moulding, one part, a lower part, forming the base of the box together with a lid having a catch

or fastening lug on one side and a pull handle on the other side, the lid and the base being integrally connected by a polypropylene hinge so that the whole of said lower part constitutes only a single element, and the other part, an upper part, forms



side portions, a top, back and front portion, the latter forming a fixed frame for the lid without any bottom cross-member, and the top having a notch and retaining edge, the whole of said upper part again constituting only a single element.

Re. 30,752

OXIME CARBONATES

Masumi Itoh, Takatsuki; Takashi Kamiya, Suita, and Daijiro Hagiwara, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Original No. 4,014,915, dated Mar. 29, 1977, Ser. No. 607,758, Aug. 26, 1975. Application for reissue Feb. 21, 1979, Ser. No. 13,324

Claims priority, application United Kingdom, Apr. 22, 1975, 16707/75

Int. Cl.[3] **C07C** *69/96*

U.S. Cl. 260—463 **25 Claims**

25. Carbonic acid esters of the formula:

$$R'_1OCOOR'_2$$

wherein R'_1 is lower alkyl which may have substituents selected from the group consisting of halogen, lower alkoxy and aryloxy, or ar(lower) alkyl, the aryl moiety of said ar(lower)alkyl may have substituents selected from the group consisting of lower alkoxy, halogen, nitro and cyano, R'_2 is a group represented by the formula:

wherein Y' is selected from the group consisting of cyano, nitro, carbamoyl, lower alkanoyl, or aryl, and said aryl may have substituents selected from the group consisting of halogen, lower alkoxy, nitro, cyano and halo (lower) alkyl, and Z' is aryl which may have substituents selected from the group consisting of halogen, lower alkoxy, nitro, cyano and halo (lower) alkyl; provided that when R'_1 is lower alkyl, Y' is aryl or cyano, and Z' is aryl, the number of carbon atoms of lower alkyl for R'_1 is 4 or 5.

Re. 30,753

PROCESS FOR THE LARGE SCALE PRODUCTION OF HUMAN GROWTH HORMONE BY SERIAL SECONDARY SUSPENSION CULTURE

Mandayam J. Narasimhan, Bangalore, India, and John A. Anderson, Menlo Park, Calif., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Original No. 4,124,448, dated Nov. 7, 1978, Ser. No. 675,643, Apr. 9, 1976. Application for reissue Jan. 7, 1980, Ser. No. 109,908

Int. Cl.[3] **C12P** *21/00;* **C12N** *5/02*

U.S. Cl. 435—68 **13 Claims**

1. A nutrient culture medium composition adapted to the production of growth hormone from pituitary cells by serial subculturing, said composition consisting essentially of effective amounts of an amino acid-rich nutrient medium supplemented by the addition of minor amounts of liver extract, insulin, and anti-biotic and anti-fungal agents.

Re. 30,754

PROCESS FOR THE PREPARATION OF GRAFT COPOLYMERS

Clarence F. Hammer, Wilmington, Del., and Harold K. Sinclair, Louisville, Ky., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,972,961, dated Aug. 3, 1976, Ser. No. 523,468, Nov. 13, 1974. Application for reissue Dec. 15, 1978, Ser. No. 969,934

Int. Cl.[3] **C08L** *51/08*

U.S. Cl. 525—379 **56 Claims**

68. Process for the preparation of graft copolymers which comprises heating for about 15 seconds to 60 minutes, with mixing, (1) a trunk copolymer of at least two monomers at least one of said monomers providing amine-reactive sites taken from the group consisting of an anhydride, a vicinal pair of carboxylic groups, and a carboxylic group adjacent to an alkoxycarbonyl group, where the alkoxy group contains up to 20 carbon atoms, and at least one of said monomers contains no amine-reactive sites, and (2) at least one side chain polymer ranging in length from about 25 to 1,000 chain atoms having per chain one active amine site taken from the group consisting of primary and secondary amines, the remainder of said side chain polymer being selected from the group consisting of polymeric organic oxides containing 2 to 16 carbon atoms, copolymers of organic oxides containing 2 to 16 carbon atoms, polymers of styrene, polymers of substituted styrenes, copolymers of styrene and substituted styrene, polymers of acrylates, polymers of methacrylates, copolymers of acrylates and methacrylates, and polymers of lactones.

69. A thermoplastic graft copolymer consisting essentially of a trunk copolymer derived from at least two monomers, at least one of said monomers providing amine-reactive sites selected from the group consisting of an anhydride group, a vicinal pair of carboxylic groups, and a carboxylic group adjacent to an alkoxycarbonyl group, where the alkoxy group contains up to 20 carbon atoms, and at least one of said monomers contains no amine-reactive sites; and at least one type side chain polymer linked to said reactive sites through amide or imide linkages, said side chain polymer being derived from a short chain polymer having about 5 to 50 repeating units and containing one active amine site selected from the group consisting of primary and secondary amines, the remainder of the side chain polymer being selected from the group consisting of polymeric organic oxides containing 2 to 16 carbon atoms, copolymers of organic oxides containing 2 to 16 carbon atoms, polymers of styrene, polymers of substituted styrenes, copolymers of styrene and substituted styrene, polymers of acrylates, polymers of methacrylates, copolymers of acrylates and methacrylates, and polymers of lactones.

Re. 30,755
PROCESS FOR THE PREPARATION OF ALKALI-METAL SALTS OF CARBOXYALKOXY SUCCINATES

Kenneth L. Lindsay, and Paul Kobetz, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Original No. 3,862,219, dated Jan. 21, 1975, Ser. No. 191,124, Oct. 20, 1971. Application for reissue Mar. 10, 1980, Ser. No. 128,830

Int. Cl.[3] **C07C** *59/22*

U.S. Cl. 562—583 **11 Claims**

1. A process for producing a high purtiy alkali metal carboxyalkoxy succinate from a zinc or alkaline earth metal carboxyalkoxy succinate contaminated with zinc or alkaline earth metal salt of at least one of maleic acid, fumaric acid and hydroxy organic acid which comprises,

selectively reacting the zinc or alkaline earth metal carboxyalkoxy succinate with a stoichiometric deficiency ratio of alkali metal carbonate for complete reaction of all zinc or alkaline earth metal salt present to form a solution of alkali metal carboxyalkoxy succinate containing a carbonate of the zinc or alkaline earth metal, and

recovering the soluble alkali metal carboxyalkoxy succinate solution from the zinc or alkaline earth metal salt residue of maleic acid, fumaric acid or hydroxy organic acid remaining after the selective reaction of the carboxyalkoxy succinate.

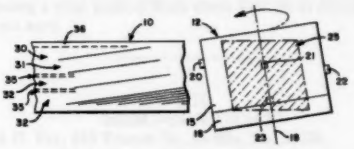
Re. 30,756
METHOD AND APPARATUS FOR VIDEO SIGNAL RECORDING

Alexander R. Maxey, Redwood City, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Original No. 4,179,717, dated Dec. 18, 1979, Ser. No. 945,421, Sep. 25, 1978. Continuation-in-part of Ser. No. 874,118, Feb. 1, 1978. Application for reissue May 2, 1980, Ser. No. 145,911

Int. Cl.[3] **G11B** *21/04*

U.S. Cl. 360—84 **5 Claims**



1. The method of signal recording comprising, moving a recording medium along a predetermined path, rotating [a plurality of] *at least three* circularly and axially spaced transducer heads, guiding the tape at an angle to the axis of rotation *around said heads so as to be in contact therewith by an angle greater than the circumferential spacing between heads and less than 180°* and to such an angular extent that the heads scan sequentially in helical fashion along separate parallel longitudinal paths of equal width on the record medium, setting the rate of rotation such that a plurality of scans of equal length occur on the separate paths at predetermined spacing, and diverting the signal equally and in predetermined sequence to different ones of said heads.

PLANT PATENTS

GRANTED SEPTEMBER 29, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,769

MINIATURE ROSE PLANT

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Mar. 28, 1980, Ser. No. 134,941

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of dwarf, hardy, bushy, rounded, much branched habit, substantially as illustrated and described, characterized by buds and flowers of a delicate apricot color near 609/3 and rose 520/3 and flower resembling the variety Helen Traubel a hybrid tea variety, (U.S. Plant Pat. No. 1,080, expired), in form and color, and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings or by budding, with a goodly amount of medium size semi-glossy foliage and an abundance of flowers borne singly on erect stems.

4,770

MUSCADINE GRAPE

Byard O. Fry, 612 Terrace St., Griffin, Ga. 30223

Filed Jul. 1, 1976, Ser. No. 701,793

Int. Cl.[3] **A01H** *5/03*

U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct hybrid plant variety of the muscadine as described and illustrated which is primarily distinguished as to novelty by the unique combination of a very vigorous vine, large fruit of a dark red color, said fruit occurring in large clusters of from about 10 to 20 berries, an individual berry diameter of about 0.8 inches, an individual berry sugar content of from about 19.5 to about 22.5 percent, and producing a crop yield of from about four (4) to about five (5) tons per acre.

4,771

MUSCADINE GRAPE

Byard O. Fry, 612 Terrace St., Griffin, Ga. 30223

Filed May 9, 1977, Ser. No. 795,116

Int. Cl.[3] **A01H** *5/03*

U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct hybrid plant variety of muscadine as described and illustrated which is primarily distinguished as to novelty by the unique combination of very large fruit having a diameter of about 1-3/16 inches, said fruit occurring in medium clusters of from 4 to 8 berries, an individual berry sugar content of from about 18.5 to 21.3 percent and producing a crop yield of from about $3\frac{1}{2}$ to about $4\frac{1}{2}$ tons per acre.

PATENTS

GRANTED SEP. 29, 1981

ERRATA

For CLASS	See PATENT NO.
411–016	4,291,608
411–282	4,291,737
369–203	4,291,886
501–004	4,292,080
501–096	4,292,081
501–100	4,292,082
501–104	4,292,083
501–107	4,292,084
250–359	4,292,536
250–361	4,292,537
250–367	4,292,538
250–374	4,292,539

PATENTS

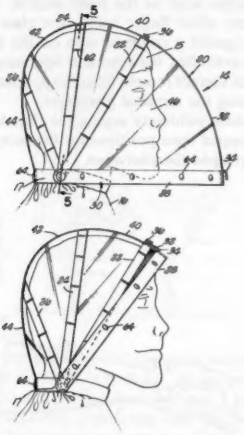
GRANTED SEPTEMBER 29, 1981

GENERAL AND MECHANICAL

4,291,417
PROTECTIVE HEAD COVERING

Alice L. Pagano, 816 S. Verdugo Rd., #1, Glendale, Calif. 91205

Continuation-in-part of Ser. No. 940,792, Sep. 7, 1978, abandoned. This application Oct. 12, 1979, Ser. No. 84,326
Int. Cl.³ A42B *1/04, 1/18, 1/20*
U.S. Cl. 2—202 **2 Claims**



1. A protective covering assembly for protecting the head of a bearer and for attachment to a garment, comprising:

(a) a protective covering for the head of the bearer, including,

(1) a flexible protective shield,

(2) a collapsible frame attached to said shield for supporting said shield about the head of the bearer, said frame including a plurality of support ribs for said shield attached to one another and a front base portion for the assembly attached to said ribs, and

(3) first covering attaching means attached to said shield for attaching said covering to the garment; and

(b) second covering attaching means for attaching said covering to the garment, including,

(1) a collar for the garment attached to the garment for attaching said covering to the garment, said collar comprising another base portion for the assembly, and

(2) means for attachment to said collar and for mating with said first covering attaching means to attach said covering to the garment;

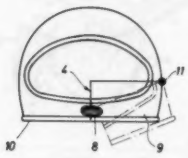
(c) said base portions being adapted to together encircle the bearer about the head region, said front portion to pass to the front of the bearer and said another portion to pass to the rear of the bearer, and being adapted for rotatable attachment to each other to permit said front portion to move before the face of the bearer with respect to said collar.

4,291,418
CRASH-HELMET

Kurt Zeisler, Buchenstrasse 4, 8351 Schwanenkirchen, Fed. Rep. of Germany

Filed Sep. 14, 1979, Ser. No. 75,735
Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720785
Int. Cl.³ A42B *3/02*
U.S. Cl. 2—410 **6 Claims**

1. A crash helmet in the from of a substantially rigid one-piece bell-shaped hood having a head portion which extends to at least the height of the auditory canal, the hood having an integrally formed substantially rigid guard portion extending fully across the chin of the wearer and a visor for covering the field of view arranged above the chin guard portion, the hood comprising at least two swiveling parts connected by means of a hinge arrangement, the parts having at least one plane of separation through the chin guard portion, the parts being interlocked by means on the abutting surfaces of the parts and

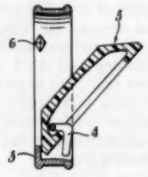


wherein the hood is separably divided at least on one side of a vertex plane and approximately at the height of the auditory canal by a transverse plane extending at a right angle to the vertex plane and between the vertex plane and the approximate auditory canal height, the approximate quarter hood sector obtained thereby swiveling about a hinge located at the approximate auditory canal height.

4,291,419
IMPLANTABLE CARDIAC VALVE PROSTHESIS

Francesco Intonti, Localita Castelli, 00060 Formello (Prov. Rome), and Antonio Intonti, No. 5, Viale Liegi, 00198 Rome, both of Italy

Filed Feb. 13, 1980, Ser. No. 121,285
Claims priority, application Italy, Jun. 13, 1979, 49402 A/79
Int. Cl.³ A61F *1/22*
U.S. Cl. 3—1.5 **2 Claims**



1. An implantable cardiac valve prosthesis, comprising:

(a) an annular element;

(b) a hollow occluder having a truncated cone shape and an articulated joint means for connecting said occluder to said annular element in which said articulated joint means comprises a filiform bracket secured at both ends to an inner wall of said annular element and to a radiused protuberance projecting from said inner wall in parallel to said bracket, said occluder further comprising a folded portion toward its interior into which folded portion said filiform bracket is inserted, said protuberance determining an aperture angle of said occluder which is 45° or less; and

(c) two stop elements provided on said inner wall symmetrically opposite to said protuberance.

4,291,420

ARTIFICIAL HEART VALVE

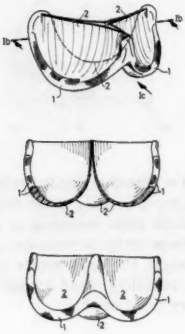
Helmut Reul, Duren, Fed. Rep. of Germany, assignor to Medac Gesellschaft fur Klinische Spezialpraparate mbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 33,942, Apr. 27, 1979, abandoned, which is a continuation of Ser. No. 655,373, Feb. 5, 1976, abandoned, which is a continuation of Ser. No. 463,135, Apr. 22, 1974, abandoned. This application Jun. 13, 1980, Ser. No. 159,386

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1973, 2355959

Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 **9 Claims**



1. An artificial, triple-lobed, semilunar valve for replacing the aortic or pulmonary valve in the heart, the valve comprising:

a flexible, non-annular, triple-lobed suture ring having substantially no resiliency which corresponds in shape to the natural aortic root, said suture ring including three, U-shaped legs, each forming a lobe of said ring, said U-shaped legs being joined to one another at the top portions thereof and being unconnected to one another at the bottom portions thereof to thereby permit free movement of said bottom portions with respect to one another in the radial direction, said suture ring being radially expandable with the dilation of said aortic root; and

three, flexible pockets mounted within said suture ring and disposed symmetrically at intervals of 120° to each other about the inside of said ring wherein when fluid flows in one direction through the suture ring the pockets bend outwards to the vessel wall and lie free-floating in the fluid thereby permitting said fluid to flow therethrough and wherein when said fluid begins to flow in the opposite direction through said suture ring, said pockets make surface-to-surface contact with one another thereby occluding the aperture within said suture ring and inhibiting fluid flow therethrough.

4,291,421

HAND AND FOREARM PROSTHESES

Peyton L. Massey, Los Angeles, Calif., and Lester T. Stormon, 1708 Magnolia Ave., Manhattan Beach, Calif. 90266, assignors to Lester T. Stormon, Manhattan Beach, Calif.

Filed Oct. 1, 1979, Ser. No. 80,410

Int. Cl.³ A61F *1/06*

U.S. Cl. 3—12.6 **8 Claims**

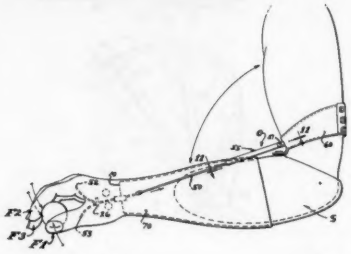
1. A prostheses for replacing the human hand partially and entirely, and including;

a palm section simulating the metacarpal bones, to be secured to the forearm of a person in a disposition duplicating a missing portion of a natural hand,

a thumb and at least one other finger simulating the proximal and extending phalanges thereof and pivotally carried in opposition to each other on axes disposed transversely of the palm section,

the carpals and metacarpal bones of the thumb and palm section being simulated by ribs extending longitudinally of and projecting downwardly and upwardly from a planar frame member disposed in a transverse medial plane, the metacarpal and phalange bones of the thumb being simulated by a lever member pivotal to a downwardly projecting rib simulating the correspondng carpal bone of the palm section, the phalange bones of the at least one other finger being simulated by a lever member pivoted to an upwardly projecting rib simulating the corresponding metacarpal bone of the palm section, the thumb and at least one other finger being first class levers yieldingly urged against a common stop on the palm section by a spring extending between and operating on the levers at the ends thereof remote from the opposed portions thereof simulating the terminal phalanges,

spring means yieldingly urging the thumb and other finger into stopped open positions for the reception of an object to be grasped therebetween,



wherein a shaft is rotatable on a said transverse axis and operably connects a multiplicity of said at least one other fingers, the at least one other finger being sectional with its terminal phalange hinged to the distal end of its proximal phalange and yieldingly urged by spring means to an inner limit from an outer restricted limit,

and operating means comprised of pull members extending from each of the fingers and through a pull point therebetween and to an anchor point on the uuper arm of the person above the elbow,

and wherein said pull members extend to a spring biased coupler that connects to said anchor point for yielding to actuation pressure increasingly applied as angularity between the forearm and upper arm is increased,

whereby a forward motion of the person's arm increases the angularity between the forearm and upper arm and draws upon the said members to pull the thumb and other finger together and into engagement with said object to be grasped thereby.

4,291,422

HYDRAULIC TOILET SEAT

John J. Shoemaker, 1372 Willivee Dr., Decatur, Ga. 30033, and Kenneth R. Stark, 10230 Fitzgerald Rd., Jonesburo, Ga. 30236

Filed May 28, 1980, Ser. No. 153,892

Int. Cl.³ A47K *17/02*

U.S. Cl. 4—251 **13 Claims**

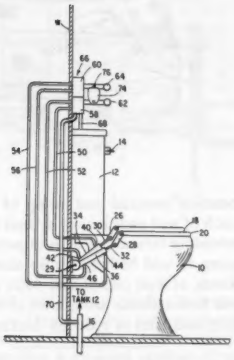
1. In a toilet bowl of the type having a seat member adapted for pivotal movement about a horizontal axis between a generally vertical position and a generally horizontal position, improved apparatus for positively controlling the movement of said seat member comprising:

a supply of water under pressure;

a hydraulic cylinder including a piston having a piston rod

disposed for bi-directional movement along the longitudinal axis of said cylinder, said cylinder further including first and second water inlet/outlet ports each disposed near a respective distal end of said cylinder;

valve means selectively operable for supplying water from said water supply to said first inlet/outlet port while receiving water exhausted from said second inlet/outlet port for causing movement of said piston rod in a first direction and for supplying water from said water supply to said



second inlet/outlet port while receiving water exhausted from said first inlet/outlet port for causing movement of said piston rod in a second direction; and

crank means operatively connecting said piston rod to said seat member for causing said seat member to assume said generally vertical position in response to movement of said piston rod in said first direction and for causing said seat member to assume said generally horizontal position in response to movement of said piston rod in said second direction.

4,291,423

HEAT RECLAMATION FOR SHOWER BATHS, SINKS, AND OTHER FLUID RECEIVING VESSELS

Mahlon T. Wilson, 5 Erie La., Los Alamos, N. Mex. 87544

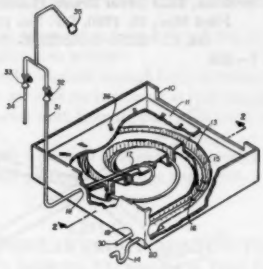
Filed Mar. 31, 1980, Ser. No. 135,362
Int. Cl.³ A47K *3/22*
U.S. Cl. 4—598 **9 Claims**

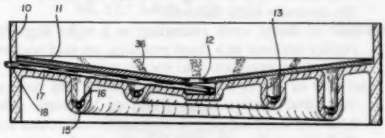
1. A fluid receiving vessel incorporating an energy exchange device for reclaiming heat energy comprising:

(a) a pan for collecting the received fluid and depositing it on a particular region of

(b) a contoured floor for directing the flow of the received fluid along a particular channel containing

(c) tubing positioned within said channel whereby the fluid flowing within said channel is in contact with the exterior surface of said tubing, the said tubing conveying fluid at a temperature different from the received fluid such that there will exist a transfer of heat energy between the fluid flowing within the said channel and the fluid flowing within said tubing, thereby heating or cooling the fluid flowing within the said tubing and reducing the amount of





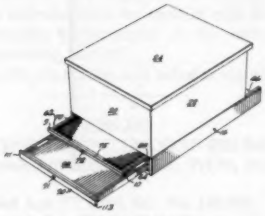
heating or cooling otherwise required in the process utilizing the fluid flowing within the said tubing.

4,291,424

BEEHIVE

Jason Angelis, 5190 NW. 4 St., Miami, Fla. 33126

Filed Mar. 19, 1980, Ser. No. 131,750
Int. Cl.³ A01K *47/06*
U.S. Cl. 6—4 R **5 Claims**

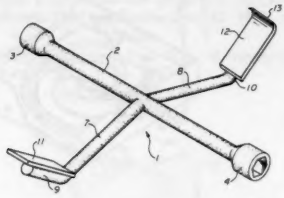


1. A beehive comprising an upper closed dome structure having a downwardly facing opening; a lower portion including spaced side walls, a front wall and a rear wall and said lower portion being sized to close the opening of said dome structure and to matingly support said upper portion; said lower portion further comprising, a first screen structure of a first predetermined common size spanning the walls and separating the lower portion into an upper chamber and a lower chamber, said first screen structure being in a fixed position; a second screen structure of a second predetermined common mesh greater than the mesh of said first screen structure, said second screen structure comprising a first drawer sized for slidable drawer-type engagement in the lower portion, said lower portion including runners for said second screen structure, said front wall having a beehive entrance mouth in open communication with the upper chamber, said lower chamber beneath said first screen structure including a second drawer with a floor spaced vertically beneath said first screen structure for collecting pollen thereon and said lower portion including access means to gain access to the lower chamber for removal of collected pollen on the floor.

4,291,425
SOCKET WRENCH

John D. Sweitzer, 9323 Sweet Brush, Houston, Tex. 77064

Filed Mar. 10, 1980, Ser. No. 128,947
Int. Cl.[3] B25F *1/00*; B25G *1/00*
U.S. Cl. 7—100 6 Claims

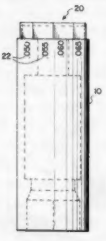


1. A cross or X-type socket wrench comprising
a longitudinally extending shaft having socket wrenches in the opposite ends thereof,
a pair of shafts, each extending at a right angle from and rigidly secured in a fixed position, on said socket shaft at a point intermediate said socket wrenches, and
said pair of shafts each having a pedal step secured at the outer end portion thereof and on the same side thereof whereby stepping on one pedal step will rotate said socket shaft in one direction and stepping on the other pedal step will rotate the same in the opposite direction.

4,291,426
COMBINATION SOCKET WRENCH AND GAUGE

Walter S. Bishop, Jr., 7300 Wild Onion, Austin, Tex. 78744

Filed May 9, 1980, Ser. No. 148,515
Int. Cl.[3] B25F *1/00*
U.S. Cl. 7—100 5 Claims



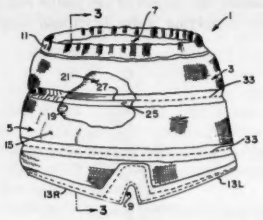
1. A combined spark plug wrench and gauge apparatus comprising
a generally tubular body;
means at one end of said body defining a polygonal socket cavity for engaging and rotating the body of a spark plug; and
a plurality of plate-like members fixedly attached to and protruding axially from the other end of said body, said members having predetermined different thicknesses for checking and setting the gap between electrodes of the spark plug.

4,291,427
FLOATATION GARMENT

Richard L. Rhea, P.O. Box 27468, St. Louis, Mo. 63141

Filed Oct. 10, 1978, Ser. No. 949,758
Int. Cl.[3] B63C *9/08*
U.S. Cl. 9—335 6 Claims

3. Buoyant swimming trunks intended to be worn on the lower body of the wearer, said trunks comprising a fabric garment having a front section, a back section, and a crotch section interconnecting the bottoms of the front and back sections so as to define two leg openings, the upper ends of said sections defining a waist opening, said front and back sections each being comprised of an outer fabric panel and an inner fabric panel defining front and rear pockets, a front floatation pad enclosed within said front pocket, a back floatation pad enclosed within said rear pocket, each of said pads being of a

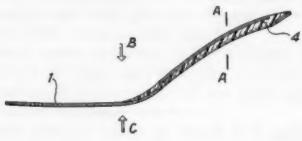


suitable floatation material and being of generally uniform thickness, each of said pads having at least one line of reduced thickness extending therealong so as to permit the ready bending and flexing of said bathing trunks along said lines of reduced thickness, at least one of said outer and inner panels of said front and back sections being sewn to its respective floatation pad along said lines of reduced thickness.

4,291,428
PROCESS FOR THE MANUFACTURE OF MOULDED INSOLES

Onorio Anzani, 10 stesso, Parabiago - Frazione San Lorenzo, Italy

Filed Jan. 3, 1980, Ser. No. 109,272
Claims priority, application Italy, Jan. 11, 1979, 19211 A/79; Aug. 6, 1979, 24945 A/79
Int. Cl.[3] A43D *0/0*; A43B *13/38*
U.S. Cl. 12—146 B 2 Claims



1. A process for manufacturing footwear insoles, formed of a flexible, porous and stickable sheet and plastic material, comprising the steps of: shearing the sheet to form a peripheral cut of the insole and an internal cut at a zone underlying the heel to thereby provide a tongue at said zone; placing the so formed insole between a die and dolly provided with a plurality of spaced rods for engaging upper and lower surfaces of said insole; stabilizing the insole and tongue in the die by urging communication of said insole and tongue with said rods, conforming the insole to the die and raising the tongue up to the dolly, and injecting the plastic material between the insole portion and the tongue to conform to a predefined contour.

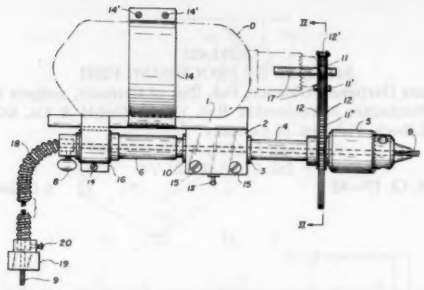
4,291,429
DRILL ATTACHMENT

Robert Servadio, 3721 Parkview Ave., Pittsburgh, Pa. 15213

Filed Oct. 3, 1979, Ser. No. 81,577
Int. Cl.[3] B08B *9/02*
U.S. Cl. 15—104.3 SN 2 Claims

1. In combination with an electric hand drill having a housing with a chuck at the forward end of said housing, an attachment comprising a frame located directly at a side of said housing, a clamp attached to said frame and surrounding said

housing for attaching said frame to said housing, means rotatably supporting a hollow shaft from said frame with said hollow shaft extending parallel to the axis of said drill, said supporting means including means rotatably supporting a rearward portion of said hollow shaft, a chuck mounted on the forward end of said hollow shaft adjacent to said drill chuck, a gear having a shaft mounted in said drill chuck, a gear support means mounted between said gear and said hollow shaft, reduction gear means mounted on said gear support means between said gear and said hollow shaft chuck to drive said hollow shaft chuck at a considerably reduced speed and in the same direction as said gear shaft, a snake extending through said hollow shaft so that a forward portion of said snake is clamped by said hollow shaft chuck, and a flexible conduit attached to the means supporting the rearward portion of said hollow shaft, whereby said snake is fed through said flexible conduit and hollow shaft and rotated at a slow speed to enable unclogging of a drain.



4,291,430

JANITOR'S RAKE FOR REMOVING STAPLES IMBEDDED IN CARPET

Ronald Hightower, 89 Whiteford Ave., Atlanta, Ga. 30307

Filed May 21, 1980, Ser. No. 151,540
Int. Cl.³ A47L *13/00*
U.S. Cl. 15—142 **9 Claims**

1. A device for dislodging a standard staple whose side portions are imbedded in carpet, the standard staple having two side portions 0.25 inch in outside length, a mid portion 0.5 inch in outside length, a diagonal length of 0.559017 inch and a diameter of 0.019 inch, the device comprising:

(A) a toothed member comprising

(1) a teeth supporter and

(2) a plurality of rigid teeth extending from the teeth supporter such that

(a) two of the teeth are spaced apart at their bottoms by a distance

(1) greater than 0.5 inch and

(2) less than 0.559017 inch and

(b) at least one tooth other than said two teeth is positioned between said two teeth such that each tooth between said two teeth is farther from each said two teeth than 0.019 inch, and

(B) means for moving the bottoms of said teeth across the carpet,

the device being so arranged and constructed that as the bottoms of the teeth are so moved

(1) the device will withstand enough force pressing the teeth downward to prevent the bottom of at least one said tooth between said two teeth from slipping over the midportion, and

(2) the device will withstand enough force pressing the teeth against the mid portion to dislodge the staple.

4,291,431

TUFTED ANGULAR BRUSH CONSTURCTION

John C. Lewis, Jr., Salisbury, Vt., assignor to Tucel Industries, Inc., Middlebury, Vt.

Division of Ser. No. 924,643, Jul. 14, 1978, Pat. No. 4,189,189.
This application Jul. 20, 1979, Ser. No. 59,479
Int. Cl.³ A46B *3/00, 9/02*
U.S. Cl. 15—159 R **3 Claims**

1. A tufted, flared brush construction comprising:

a semi-rigid thermoplastic sheet substrate having a convex configuration;

a plurality of mutually spaced synthetic filament tufts, each of said tufts mounted on said substrate at an end fused integrally thereto, each of said tufts extending outwardly at an angle different from the angle of each adjacent tuft and substantially perpendicular to the surface of said substrate mounting said tuft;

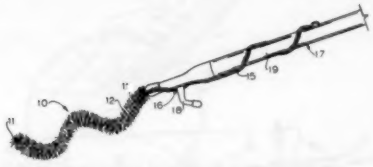
handle means for supporting said tufted construction.

4,291,432

ANCHOR CHAIN CLEANING BRUSH

Arthur R. Cogswell, 4100 Five Oaks Dr., TH-36, Durham, N.C. 27707

Filed Apr. 17, 1980, Ser. No. 140,993
Int. Cl.³ A46B *3/18*
U.S. Cl. 15—160 **4 Claims**



1. An integral cleaning brush for cleaning a strand of anchor chain, anchor rope, or the like, comprising:

(a) a relatively stiff, resilient, twisted wire armature having a forward helical brush retaining portion and a trailing helical extension portion;

(b) brush material forming bristles associated with said armature brush retaining portion in a twisted-in-wire configuration; and

(c) a loop configuration formed of and as part of said helical

extension portion and proximate the trailing end of said brush material, said loop configuration being adapted to pass over the hook of a boat hook when said helical extension portion is wound on the staff thereof such that said staff may serve as a handle for said brush retaining portion enabling said anchor strand to be cleaned by reciprocal motion of said brush material over the length thereof.

4,291,433

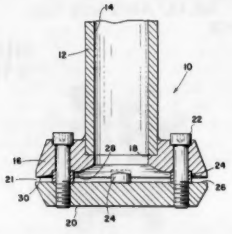
APPARATUS FOR STEAM CLEANING LINERS IN OIL WELL BORES AND THE LIKE

William D. Newsom, and James R. Carnahan, both of Bakersfield, Calif., assignors to K. R. Evans & Associates, Bakersfield, Ca[l]if., a part interest

Division of Ser. No. 473,697, May 28, 1974, Pat. No. 4,037,660. This application Jan. 3, 1977, Ser. No. 756,331

Int. Cl.[3] A47L *5/14*

U.S. Cl. 15—405 **2 Claims**



1. A head for ejecting fluid therefrom and comprising a sleeve having a fluid passageway extending longitudinally therethrough, a circumferential flange provided at one end of the sleeve, a plate secured to the circumferential flange and spaced therefrom to provide a hiatus around the outer periphery thereof, the inwardly directed faces of the plate and flange defining a substantially continuous 360° fluid passageway having at least one flat face and having a substantially constant cross-sectional flow area throughout the extent thereof, said hiatus being in communication with the fluid passageway for receiving the fluid therefrom and ejecting the fluid radially outwardly from the head.

4,291,434

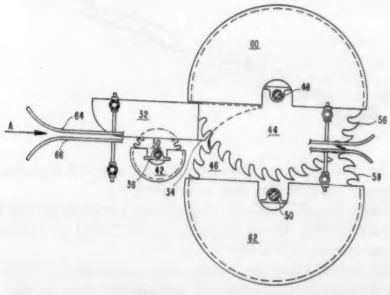
TENDON PULLING

Tom Batts, Rose Hill, N.C., assignor to Swift & Company, Chicago, Ill.

Filed Mar. 28, 1977, Ser. No. 782,171

Int. Cl.[3] A22C *21/00*

U.S. Cl. 17—11.3 **9 Claims**



1. An improved method for pulling tendons from the legs of poultry carcasses, said method comprising: carrying poultry carcasses by the feet thereof along a straight path; breaking the lower legs of said carcasses while being carried at a given level without appreciably tearing the skin or separating the feet therefrom; thereafter applying oppositely directed shearing forces to said lower legs slightly spaced both above and below said level while said carcasses are so carried; and continuing said shearing forces sufficently to tear the skin at each lower leg to sever each foot and to pull tendons from each upper leg of said carcasses.

4,291,435

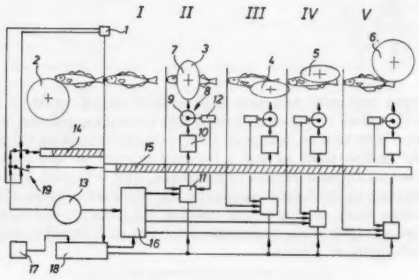
METHOD OF PROCESSING FISH

Franz Hartmann, Oldesloe, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany

Filed Nov. 9, 1979, Ser. No. 92,693

Int. Cl.[3] A22C *25/14*

U.S. Cl. 17—45 **6 Claims**



1. A method of processing fish in a fish processing machine, by controlling setting members and control paths of tools and guides arranged sequentially along the conveying path of the fish in said machine, a quantity to be measured or magnitude value corresponding to the size of a fish being determined by measuring each fish at a single measuring location lying in the region of the fish conveying path and upstream of the first tool to be controlled, an application value for each setting member being derived from a fish value proportional to the measured value of the fish to be processed, and from a position value corresponding to the distance between the tool to be actuated and the measuring location, and a displacement value proportional to the measured value being stored before being used for controlling the respective setting member, the method comprising the steps of

(a) using position values of each tool, measured by way of travel units of the fish along its conveying path and stored in permanent storage means, and fixedly programmed proportionality factors for the fish value and for the displacement value;

(b) measuring the measured value in travel units of the fish and storing it in erasable storage means;

(c) effecting a starting pulse to be received by control device means and measuring device means when one of the ends of said fish passes by said measuring location;

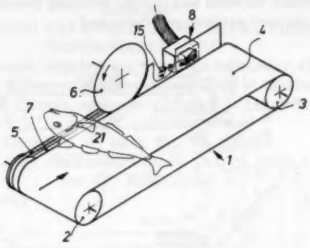
(d) said control device means thereupon effecting the computing of said displacement value and said application value for each tool and their storage as well as the comparison of a sum of counting pulses with said stored application values, said sum of counting pulses increasing in the control device means; and

(e) said control device means causing the delivery of an application value to the setting member of the respective tool when the sum of counting pulses equals said application value.

4,291,436
APPARATUS FOR EXTRACTING THE ENTRAILS AND/OR CLEANING THE BELLY CAVITY OF FISH

Hermann Wulff, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 101,091
Int. Cl.[3] A22C *25/14*
U.S. Cl. 17—59 11 Claims



1. An apparatus for extracting the entrails and/or cleaning the belly cavities of decapitated fish, said apparatus comprising

a conveyor for advancing the fish essentially transversely to their longitudinal axes and with their decapitation faces lying in a decapitation plane essentially perpendicular to the conveying plane,

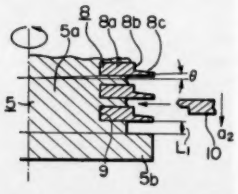
a suction device having a suction opening lying essentially in said decapitation plane, and

means arranged behind said suction opening in said suction device for physically gripping those parts of the belly contents of the fish which have been sucked into said suction opening and for extracting the same from the belly cavity.

4,291,437
COMBING ROLLER UTILIZED FOR AN OPEN-END SPINNING MACHINE

Toshio Yoshizawa, Chiryu; Yoshiaki Yoshida, Oobu, and Katsuaki Sugiura, Okazaki, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 26, 1979, Ser. No. 107,073
Claims priority, application Japan, Dec. 26, 1978, 53-179652
Int. Cl.[3] D01G *15/14, 15/84*
U.S. Cl. 19—112 3 Claims

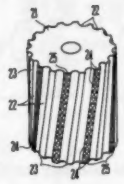


1. An improvement of a combing roller utilized for an open-end spinning machine, wherein a metallic wire is mounted on a body of said combing roller, said body comprises a main cylindrical body and a pair of flanges coaxially formed at both ends of said main body, a base portion of said metallic wire is pressed into a right hand or left hand helical groove, and the working direction of said metallic wire coincides with the rotational direction of said combing roller, said improvement comprising a first free cylindrical space formed on said main body at a first position between one of said flanges located at a side corresponding to the direction of progress of either an imaginary right hand screw imaginarily engaged with said right hand helical groove or an imaginary left hand screw imaginarily engaged with said left hand groove when said imaginary screw is turned in the counter-clockwise direction and a tooth point of the end portion of said metallic wire, a second free cylindrical space formed on said main body at a second position between the other flange and a tooth point of the other end portion of said metallic wire, the axial size of said first cylindrical space being smaller than that of said second cylindrical space.

4,291,438
FIBER FEEDING ROLLER OF OPEN-END SPINNING APPARATUS

Kazuo Seiki, and Noriaki Miyamoto, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Feb. 7, 1980, Ser. No. 119,593
Claims priority, application Japan, Feb. 17, 1979, 54-19617
Int. Cl.[3] D01G *19/10*
U.S. Cl. 19—112 5 Claims

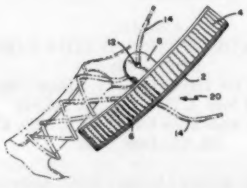


1. A fiber feeding roller in a fiber-bundle supply mechanism in which said feeding roller is so adapted as to coact with a pressing member to supply a bundle of fibers to fiber separating mechanism in an open-end spinning apparatus, the outer circumferential surface of body of said feeding roller being formed with a plurality of rows of projections having flat surface thereon and extending in axial direction of said feeding roller body and a plurality of rows of projections having knurled surface formed thereon are arranged between said projections with flat surface.

4,291,439
KNOT SECURING DEVICE

Alfred A. Riti, 61 Bronx River Rd., Yonkers, N.Y. 10701

Filed Jun. 18, 1979, Ser. No. 49,936
Int. Cl.[3] F16G *11/00, 11/10*
U.S. Cl. 24—119 4 Claims



1. A device for securing bow-knots comprising,

a strap of flexible material,

said strap having on one side thereof regions of hook and loop elements,

a first of said regions extending from one end of said strap toward the middle thereof, comprising a field of hook elements,

a second said regions, extending from the other end of said strap toward the middle thereof, comprising a field of loop elements, said first and second regions being adopted to be brought into fastening contact with each other by folding

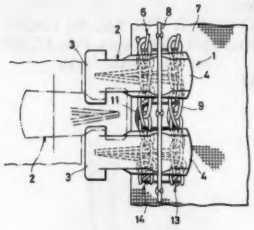
said strap about the middle thereof and an anchoring element provided at about the middle of said strap and fixed thereto, said anchoring element extending outwardly in the plane of said strap and having a perforation therein to receive a lace.

4,291,440

MOLDED COUPLING ELEMENT ASSEMBLY

Hiroshi Yoshida, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 22, 1979, Ser. No. 41,329
Claims priority, application Japan, Jun. 5, 1978, 53-67434
Int. Cl.³ A44B *19/40*
U.S. Cl. 24—205.16 R **19 Claims**



1. A coupling element assembly for slide fasteners comprising:

a row of laterally spaced coupling elements each having a head portion and a pair of leg portions extending from said head portion; and

a pair of warp-knit elongate webs each including at least one first thread forming a wale of chain stitches and a second thread disposed in and extending longitudinally along said wale of chain stitches, each of said warp-knit elongate webs extending transversely of said spaced coupling elements and having a longitudinal portion embedded in respective leg portions of said coupling elements to interconnect the coupling elements,

each of said warp-knit elongate webs including a pair of first threads forming a pair of laterally spaced wales of chain stitches,

a third thread interlaced with the first threads in said warp-knit elongate webs and having a plurality of parallel portions spaced longitudinally on said first threads and extending transversely of said wales, and said parallel spaced portions extending substantially the full length of said coupling elements.

4,291,441

APPARATUS FOR OPENING TEXTILE FABRICS IN ROPE FORM

Mariano Bassani, Via Trento Trieste 7, Arcore (Milan), Italy

Filed May 2, 1980, Ser. No. 146,916
Claims priority, application Italy, May 4, 1979, 67933 A/79
Int. Cl.³ D06C *3/06*
U.S. Cl. 26—75 **6 Claims**

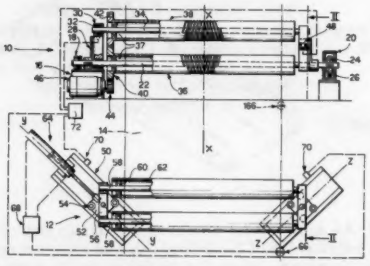
1. Apparatus for opening a textile which is gathered together in rope form, including a spreading device comprising:

two spreading cylinders with helically-ridged surfaces located in the path of advancement of said textile through said apparatus such that the textile passes circumferentially over a portion of each said surface in succession; drive means for rotating each said cylinder about its longitudinal axis in the opposite circumferential direction to the direction of advance of said textile over the respective said surface, said two cylinders being rotated in opposite senses, in use; and

displacing means for displacing a displaceable one of said cylinders in a direction perpendicular to its axis to vary the frictional force between said textile and the surfaces of the cylinders, in use, wherein:

a pivotable one of said two spreading cylinders is pivotable, in opposite senses, from a normal working position, in which said longitudinal axes of said cylinders are parallel to each other, into two respective extreme positions in which the axis of said pivotable cylinder is inclined to the axis of the other of said cylinders;

pivoting means are provided for pivoting said pivotable cylinder between said normal working position and each of said two extreme positions; and



sensor means are located downstream of said spreading device for sensing a displacement of said textile from said direction of advance, said sensor means being operative on sensing a displacement of the textile to activate said pivoting means to pivot said pivotable cylinder from said normal working position to one of said extreme positions so as to reduce the frictional force between the textile and the ends of the cylinders towards which the textile is displaced.

4,291,442

PROCESS FOR FIBRILLATING POLYESTER

Francis W. Marco, Pauline, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 947,368, Oct. 2, 1978. This application Jun. 30, 1980, Ser. No. 164,385
Int. Cl.³ D06C *27/00*
U.S. Cl. 28—159 **18 Claims**

1. A process for improving the hand and comfort of a textile fabric comprising a plurality of yarns each said yarn compris-

ing a multiplicity of texturized polyester filaments comprising the steps of:

treating said textile fabric with an alkaline aqueous solution having a pH of at least about 9.5, the temperature of said solution being between about 30 and 70; and

breaking on an average basis at least about 5 of said filaments per square centimeter of fabric while said fabric is wet with said aqueous alkaline solution.

4,291,443

FORMING EXPANDED MESH SHEET FROM DEFORMABLE STRIP

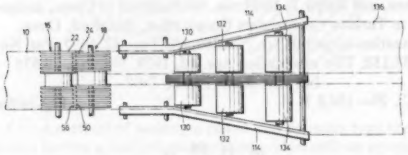
Gordon H. Laurie, Mississauga; Theodore J. Seymour, Oakville; Randall T. Sakauye, Mississauga, and John V. Marlow, Oakville, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Dec. 18, 1978, Ser. No. 970,298

Claims priority, application Canada, Oct. 31, 1978, 315190

Int. Cl.³ B21D *31/04*

U.S. Cl. 29—6.1 **6 Claims**



1. A method of forming expanded mesh sheet from a deformable strip comprising the steps of concurrently slitting and preforming at least a portion of said strip contained within imperforate border portions to provide one or more longitudinally extending strand-like components, said components comprising elongated slit segments deformed out of the plane of the strip and unslit segments retained in the plane of the strip, said elongated slit segments being severed from laterally adjacent segments and said border portions and being substantially convexly shaped from the plane of the strip whereby slit segments in laterally adjacent components extend from opposite sides of the plane of the strip, and said unslit segments retained in the plane of the strip together define continuous bands extending laterally at least the width of said one or more strand-like components across the said portion of the strip; slitting the strip at alternate bands to extend the slit segments in a staggered relation and to define nodes therebetween; and laterally expanding the slit preformed portion of the strip wherein the nodes remain substantially in the plane of the strip to form said mesh sheet by drawing opposite longitudinal edges of the strip apart whereby the elongated segments form a network of substantially flattened mesh joined by said nodes wherein unslit portions of the bands provide bonds between adjacent components.

4,291,444

PROCESS OF MANUFACTURING A TUNGSTEN LAMP FILAMENT

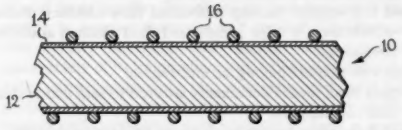
Lewis V. McCarty, Cleveland Heights, and John W. Pugh, Gates Mills, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,545

Int. Cl.³ B21F *3/04, 45/00*

U.S. Cl. 29—25.14 **5 Claims**

1. An improved process of manufacturing a tungsten lamp filament which includes coiling and heat treating said filament to at least 1600° C. on a molybdenum wire mandrel until significant stress relaxation has taken place, wherein the improvement comprises coating the bare metal surface of said wire mandrel with a chemical vapor deposit of a refractory metal selected from tungsten and tantalum prior to said coiling and



heat treating steps to thereby prevent molybdenum contamination of said tungsten filament.

4,291,445

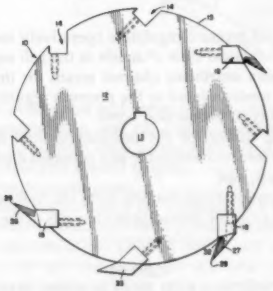
ROTARY CUTTING BLADE ASSEMBLY

Morris V. Johnson, Lima, Ohio, assignor to National-Standard Company, Niles, Mich.

Filed Mar. 6, 1980, Ser. No. 127,644

Int. Cl.³ B23D *71/00;* **B27G** *13/00;* **B26D** *1/12*

U.S. Cl. 29—78 **7 Claims**



1. A cutting blade assembly for mounting to a rotating arbor for slicing material from a workpiece, including in combination:

wheel means having a plurality of pockets equally spaced about the outer annular surface thereof, said wheel means including a bore therein for mounting to the rotating arbor,

a plurality of cutting blade members each comprised of a base portion and a blade projection portion, said blade projection portion extending forwardly and outwardly from said base portion, said blade projection portion including a primary cutting edge extending radially along the leading surface of said blade projection portion to provide a guillotine-like cutting edge, and a secondary cutting edge extending rearwardly from the outward corner of said primary cutting edge with said base portion being adapted to be fixedly mounted in said pocket in said wheel means to complete the blade assembly.

4,291,446

CONTROLLED DEFLECTION ROLL

Ignazio Marchioro, Schio, Italy, assignor to Escher Wyss Aktiengesellschaft, Zurich, Switzerland

Filed Oct. 22, 1979, Ser. No. 87,092

Claims priority, application Switzerland, Oct. 31, 1978, 11193/78

Int. Cl.³ B21B *13/02*

U.S. Cl. 29—116 AD **9 Claims**

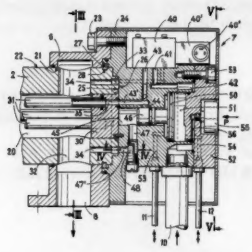
9. A controlled deflection roll comprising:

a stationary roll support;

a roll shell rotatable about said stationary roll support;

means for mounting said roll shell to be rotatable about said stationary roll support;

a plurality of pressure elements upon which there is supported said rotatable roll shell;
said roll support having individual flow channels through which there is infed pressurized fluid medium at different pressures;
said roll support having an end region;
supply head means detachably secured to said end region of said roll support;
said detachable supply head means containing therein:



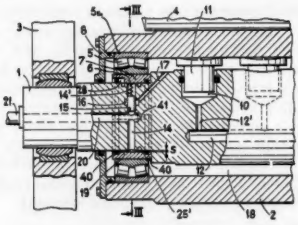
individual pressure regulators operatively associated with the individual flow channels in the roll support;
a common distributor channel means for the pressurized fluid medium infed to the pressure regulators;
a plurality of connection bores;
infeed line means for the pressurized fluid medium with which there is connectable said common distributor channel means; and
said connection bores leading from the individual pressure regulators to the related flow channels in the roll support.

4,291,447

CONTROLLED DEFLECTION ROLL

Ignazio Marchioro, I-Schio, Italy, assignor to Escher Wyss Limited, Zürich, Switzerland

Filed Nov. 5, 1979, Ser. No. 91,512
Claims priority, application Switzerland, Nov. 15, 1978, 11724/78
Int. Cl.³ B21B *13/02*
U.S. Cl. 29—116 AD **9 Claims**



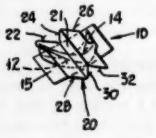
1. A controlled deflection roll comprising:
a stationary roll support;
a rotatable roll shell;
bearing means for rotatably mounting said roll shell at its ends for rotation about said stationary roll support;
at least one pressure element arranged between said stationary roll support and said roll shell for rotatably supporting said roll shell at said stationary roll support;
said pressure element exerting a support force at the roll shell in a force direction which substantially passes through a pressure plane extending through the lengthwise axis of the roll shell;
said bearing means for rotatably mounting the roll shell at the stationary roll support containing play in the pressure plane in a direction opposite to said force direction;
said play enabling movement of the bearing means in relation to the stationary roll support out of a work position in the direction of the direction exerted by said pressure element;
a yieldable force applying element for retaining with a predetermined force said bearing means at the stationary roll support in the work position; and
a control device arranged between said stationary roll support and said roll shell which, upon displacement of said bearing means out of the work position at the stationary roll support, limits the support force of the pressure element which is exerted against the force of the force applying element.

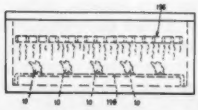
4,291,448

METHOD OF RESTORING THE SHROUDS OF TURBINE BLADES

Salvatore J. Cretella, North Haven; Matthew Bernardo, West Haven, and Ralph T. DeMusis, Madison, all of Conn., assignors to Turbine Components Corporation, Branford, Conn.

Continuation-in-part of Ser. No. 859,438, Dec. 12, 1977, Pat. No. 4,155,152. This application Apr. 12, 1979, Ser. No. 29,571
Int. Cl.³ B23P *15/02, 7/00*
U.S. Cl. 29—156.8 B **17 Claims**





1. The method of repairing worn turbine blades which are originally cast to a predetermined geometry, and formed of a metal selected from the group consisting of nickel-based and cobalt-based alloys, comprising the steps of grinding down to an accurately predetermined dimension, with respect to a predetermined but no longer existing original finished geometry of the shroud thereof, any of the worn, undersized edges of the Z-notch portion of the mounting shroud at one end of the blade, masking the shroud on both sides of said edge after the grinding thereof, subjecting said ground-down edge to a plasma stream comprising essentially a metal selected from the group consisting of nickel-based and cobalt-based alloys, said plasma stream having essentially the same composition as that of the turbine blade being repaired and being applied to an extent which is just sufficient to build up said edge substantially to its original overall finished dimension, such that the added alloy and the metal of the blade become essentially homogeneous and of similar composition, and thereafter sintering said blade at elevated temperatures for a predetermined length of time to season the repair.

4,291,449
METHOD OF MAKING A STEM SEAT FOR A PISTON AND CYLINDER TYPE THERMAL DEVICE

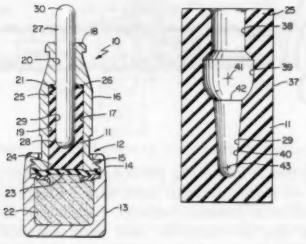
Warren G. Williamson, Louisville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 58,084, Jul. 16, 1979, Pat. No. 4,235,109, which is a continuation-in-part of Ser. No. 918,069, Jun. 22, 1978, Pat. No. 4,179,928. This application Feb. 1, 1980, Ser. No. 117,650

The portion of the term of this patent subsequent to Dec. 25, 1996, has been disclaimed.

Int. Cl.³ G01K *5/32;* **B23P** *15/00*

U.S. Cl. 29—157.1 R **24 Claims**



1. In a method of making a piston and cylinder type thermal device having a resilient stem seat provided with an opening in one end thereof and receiving an actuating stem in said opening that is adapted to reciprocate in said opening in response to the thermal expansion and contraction of a charge of material in said device and operatively acting on said stem seat adjacent the other end thereof, said opening having three portions thereof disposed in serially aligned and interconnected relation, said stem having three portions thereof respectively disposed in said three portions of said opening, said portions of said opening and said stem each having a main diameter, said main diameters of said portions of said stem being substantially the same size, the improvement comprising the steps of forming one of said portions of said opening to be adjacent said other end of said stem seat and to be substantially smaller in said diameter thereof than said diameter of the portion of said stem that is to be received in said one portion when said stem seat is in the unassembled condition thereof, forming another of said portions of said opening to be adjacent said one end of said stem seat and to be substantially smaller in said diameter thereof than said diameter of the portion of said stem that is to be received in said other portion when said stem seat is in the unassembled condition thereof, and forming the remaining portion of said opening to comprise an intermediate portion of said opening that joins with said one portion and said other portion and has its said diameter substantially the same size as said diameter of the portion of said stem that is to be received in said intermediate portion when said stem seat is in the unassembled condition thereof.

4,291,450
METHOD AND APPARATUS FOR MANUFACTURING FINNED HEAT EXCHANGERS

Eugene E. Rhodes, Belleville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

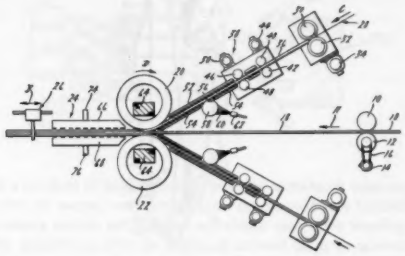
Filed Oct. 5, 1979, Ser. No. 82,248

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—157.3 R **2 Claims**

1. In a method for series manufacture of:

heat exchange elements of the type which comprise a metallic, relatively thin walled basic profile provided with a longitudinally extending surface engaging member which is in the form of a metallic strip corrugated transversely of the longitudinal axis thereof which is in intimate heat conducting contact with said basic profile wherein the following steps are carried out prior to the actual manufacture of the heat exchange elements or in conjunction with the manufacture thereof: (a) forming desired lengths of said basic profile, (b) advancing said lengths of basic profile in a series from one end thereof, (c) advancing concurrently therewith said metallic strip corrugated transversely of its longitudinal axis, (d) guiding said corrugated strip successively into abutment with said basic profile, (e) impinging a stream of a gaseous medium against said corrugated strip in order to exert a holding force so that the crests of the corrugations of said corrugated strip are held in firm abutment with said basic profile, (f) establishing a permanent metallic bond between



said basic profile and said crests of said corrugations of said corrugated strip, and (g) cutting said basic profile with said corrugated strip permanently fixed along the length thereof into desired lengths;

the improvement comprising:

supplying the heat necessary for establishing a permanent metallic bond between said basic profile and said crests of said corrugations at the position where said corrugated strip is guided into abutment with said basic profile, and developing said supplied heat by means of an induction heating coil positioned at a position where said corrugated metallic strip has been fed into abutment with said basic profile.

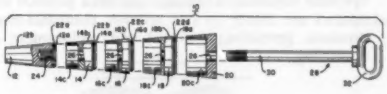
4,291,451
O-RING TOOL

Brian S. O'Neill, 12-I Community Dr., and Clay E. Tully, 216 Community Dr., both of Shillington, Pa. 19607

Filed Aug. 13, 1979, Ser. No. 65,879

Int. Cl.³ B23P *19/02, 19/08*

U.S. Cl. 29—235 **4 Claims**



1. A tool for mounting elastic rings comprising:

a plurality of generally frustoconical sections, each section having a base portion and a top portion opposite the base portion;

means adjacent the base of each section for securing the section on a member adapted to receive an elastic O-ring;

interfitting means for joining the sections together;

retainer means for releasably holding the section in assembled relationship;

wherein at least one of the sections includes a longitudinal passageway extending therethrough and the retainer means comprises an elongate member extending through the passageway; and means for holding the section on the elongate member.

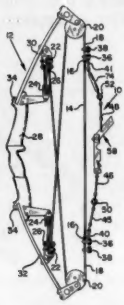
4,291,452
TENSION RELIEVING AND BOWSTRING REPLACING DEVICE FOR COMPOUND BOW

Archie E. Whitman, Sr., Seal Rock, and Donald D. W. Lathrops, Springfield, both of Oreg., assignors to Whitlath Co., Newport, Oreg.

Continuation-in-part of Ser. No. 73,714, Sep. 10, 1979, abandoned. This application Mar. 28, 1980, Ser. No. 135,170

Int. Cl.³ B23P *19/02*

U.S. Cl. 29—235 **10 Claims**



1. For use with a compound bow of the type having the bowstring normally stretched between two oppositely biased tensioned cables, opposite ends of said bowstring being releasably coupled to said cables by bowstring fasteners fixed to said cables, a device to aid in replacement of the bowstring and permit storage of said compound bow with said bowstring removed, said device comprising:

(a) a pair of connectors each defining socket means for engaging a respective one of said bowstring fasteners;

(b) slotted cable retainer means associated with each of said connectors, for retaining the respective one of said connectors in engagement with the respective one of said bowstring fasteners;

(c) elongate linking means disposed between said pair of connectors for linking said connectors to each other;

(d) a lever-operated tensioner included in said elongate linking means, said lever-operated tensioner having an extended position and a contracted position, the length of said linking means being such that when said lever-operated tensioner is in its extended position said connectors may be separated farther from one another than the maximum distance between the farthest separated portions of said bowstring fasteners when said bowstring is connected therebetween and that when said lever-operated tensioner is in said contracted position said connectors are closer to one another than said maximum distance, permitting removal and replacement of said bowstring.

4,291,453
APPARATUS FOR AND METHOD OF SEVERING A FLEXIBLE REINFORCED ELASTOMERIC CONDUIT SUPPORTED ON A PLURALITY OF ELONGATED END-TO-END RIGID MANDRELS

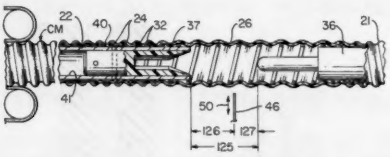
Julien C. Mathieu, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Oct. 9, 1979, Ser. No. 83,065

Int. Cl.³ B29C *17/14;* **B29D** *23/05;* **B26D** *3/16;* **B23P** *17/00*

U.S. Cl. 29—417 **20 Claims**

1. In a machine system for producing a continuous flexible reinforced elastomeric conduit comprising; a plurality of elongated rigid mandrels having connecting means at opposite ends thereof for connecting said mandrels in aligned end-to-end relation; said conduit being supported by associated ones of said mandrels in connected relation during continuous production and movement of said conduit in a rectilinear path; and an apparatus for severing said conduit adjacent each connecting means of each mandrel; the improvement wherein said severing apparatus comprises; a carriage supported for movement along said rectilinear path, said carriage having means supporting the connected mandrels and conduit disposed therearound during said movement on said carriage, a cutter carried on said carriage for movement therewith along said rectilinear path, a support structure supporting said cutter on said carriage for movement in a cutting path transverse said rectilinear path, means on said carriage for detecting said connecting means, pulling means operatively connected to and controlled by said



detecting means for pulling the connecting means of an adjoining pair of mandrels apart over said carriage to provide a controlled axial distance between connecting means of said adjoining pair of mandrels, said axial distance being surrounded by a corresponding length of said conduit and having portions of said axial length on opposite sides of said cutting path, and an actuator for moving said cutter along its support structure and cutting path for cutting through said corresponding length of conduit, said severing apparatus serving to cut through the conduit at each end of each mandrel so that each mandrel has a length of conduit therearound which is approximately equal to the length of the mandrel.

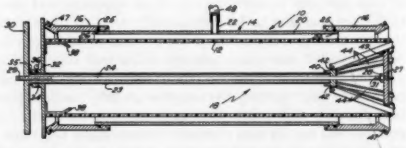
4,291,454
RUBBER BOOT EXPANDER

John Sawaryn, Norwich, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 4, 1979, Ser. No. 71,886

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—426.6 **5 Claims**



1. A rubber boot expanding mechanism comprising:

a metallic cylinder with an evacuating pipe;

adjusting means for providing a hermetically sealed extension to said metallic cylinder, said adjusting means comprises two pieces, each piece having a cylindrical portion adapted to connect to either end of said metallic cylinder, said adjusting means further includes two O-rings with each of said O-rings providing a hermetic seal between said adjusting means pieces and said metallic cylinder;

a boot spreader adapted to be located axially inside the hollow portion of said metallic cylinder and said adjusting means, said boot spreader having expanding means for expanding radially an end of said rubber boot;

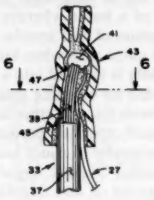
sealing means for providing a hermetic seal between a radially expanded end of the rubber boot and said end that spreads outward of said adjusting means, said sealing means includes a plurality of C clamps; and

a yoke connected to said boot spreader, said yoke adapted to hold the end of the rubber boot that is opposite to the expanded end.

4,291,455
METHOD OF MAKING AN EXTENDED LIFE, MOISTURE RESISTANT ELECTRIC MOTOR AND METHOD OF MAKING SAME

William J. Schnyder, Kirkwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 23, 1979, Ser. No. 59,589
Int. Cl.³ H02K *15/12*
U.S. Cl. 29—596 7 Claims



1. A method of manufacturing a moisture resistant electric motor, said motor having a stator assembly including a core made of a stack of laminations of suitable magnetic material, each lamination having a central opening and a plurality of notches extending radially outwardly from the central opening, said central opening constituting a bore of the core and said notches constituting a plurality of slots extending longitudinally through the core, said stator assembly further including a plurality of coils of magnet wire adapted to be inserted in said slots thereby to constitute the windings of the motor, said windings being adapted to be electrically connected to one another and to power leads for energization of the motor with the connections of these coils and power leads being referred to as junctions, wherein the method of this invention consists of the steps of:

forming said coils of magnet wire having electrical insulating material thereon of non-moisture absorbent synthetic resin material;

inserting insulators of electrical insulating material in each of said stator slots, said insulators being formed from non-moisture absorbent synthetic resin material;

inserting portions of one or more coils of said magnet wire in each of said slots with said insulators electrically insulating said coils of magnet wire from said core laminations forming said slots;

inserting a wedge constructed from a non-moisture absorbent synthetic resin material into the open ends of each of said slots after insertion of said coils so as to close the slots and to protect and electrically insulate the coils therein;

connecting a plurality of power leads to specified coils of said motor windings by making an electrical junction of the magnet wires of said specified coils and the conductors of said power leads and connecting said coils together as required so as to constitute the poles of the motor;

applying a connection insulator to each of said junctions, each of said connection insulators having a heat-shrinkable outer shell with an inner coating of mastic-like material which adheres the connection insulator to its respective junction prior to being heat shrunk-in-place thereon;

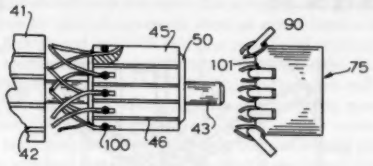
dipping said stator assembly in a liquid electrical insulation material so as to coat all surfaces of said stator assembly with said electrical insulation material and so as to permit the flow of said liquid insulation material into said connection insulators; and

baking said stator assembly in an elevated temperature environment for a time sufficient to cure said electrical insulation material and for heat-shrinking said connection insulators in place on their respective junctions whereby excess liquid electrical insulation material is forced out of said connection insulators and said mastic-like coating is caused to flow within said outer shell so that said cured electrical insulation material and said mastic-like coating effectively seal moisture from said junctions.

4,291,456
METHOD OF WINDING A COMMUTATOR

Kenneth E. Peck, Jr., 20 Oakwood Dr., Pittsboro, N.C. 27312, and Donald L. Jordan, Rte. 4, Box 576, Chapel Hill, N.C. 27514

Filed Mar. 10, 1980, Ser. No. 128,738
Int. Cl.³ H02K *15/09;* H01R *43/08*
U.S. Cl. 29—597 5 Claims



1. In a method of automatically winding armatures wherein armatures are wound and commutator connections are formed at a winding station utilizing an automatic tang-type winding machine adapted to loop the coil ends around tangs associated with the commutator bars, the steps of:

(a) forming the commutator with electrically isolated bars and an associated set of winding tangs formed in a manner enabling the same to be removed after winding and without impairing the commutator connections;

(b) winding the armature with an automatic tang-type winding machine and in the course of winding looping selected coil end wires on selected tangs according to the tang-type winding method;

(c) electrically connecting the said coil end wires to the corresponding commutator bars;

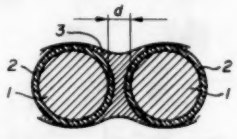
(d) severing those portions of the coil end wires on the tangs from the corresponding electrical connections on the commutator bars; and

(e) removing the tangs from the commutator thereby leaving a lead loop-type connected commutator.

4,291,457
METHOD OF MAKING SELF-SUPPORTING ROTOR COIL DC-MACHINE

Marc Heyraud, Recorne 24b, 2300 La Chaux-de-Fonds, Switzerland

Filed Aug. 2, 1979, Ser. No. 63,094
Claims priority, application Switzerland, Aug. 9, 1978, 8460/78
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—598 5 Claims



1. A method of making a cylindrical, ironless, self-supporting rotor coil, wherein the wire used for winding the coil comprises an outer layer of a material capable of being softened and subsequently solidified, said outer layer surrounding an insulating layer of the wire, comprising the step of subjecting said wire to a softening treatment of said outer layer during the winding process, a winding pitch being made substantially equal to $D_{is}/\cos\beta$, where D_{is} represents the outer diameter of

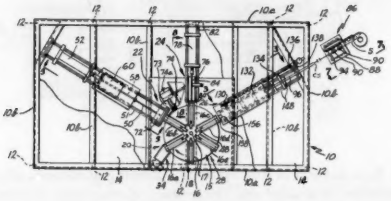
the said insulating layer of the wire and β the angle formed between the wire placed on the coil and a generatrix of the cylindrical rotor surface.

4,291,458

APPARATUS AND METHOD FOR INSTALLING WICKING IN CANDLES

Robert W. Flinn, Blytheville, Ark., assignor to American Greetings Corporation, Cleveland, Ohio

Filed Jul. 31, 1978, Ser. No. 929,671
Int. Cl.³ B29C *27/30*
U.S. Cl. 29—650 **18 Claims**



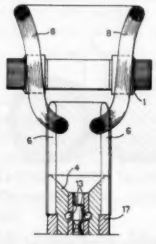
1. An apparatus for automatically installing wicking in a candle body, comprising, a movable support for a candle body, a bore forming station for forming a generally axial opening in an associated candle body when mounted on said support, a clean-out station including a reciprocable heated member for cleaning out the opening formed in the candle body, a feed station for moving a generally rigidified strand of wicking through the formed opening in the candle body, said clean-out station being disposed intermediate said forming station and said feed station for cleaning out the opening formed in the candle body prior to movement of the latter to said feed station, said feed station including cutting means for sequentially severing a measured amount of wicking supplied at said feed station, and means for automatically moving said candle body support from said forming station to and from said cleaning station and thence to said feed station.

4,291,459

DEVICE FOR INSERTING PRE-WOUND COILS INTO STATOR SLOTS

Giorgio Barrera, Leumann, Italy, assignor to Officine Meccaniche Pavesi & C. S.p.A., Turin, Italy

Filed Jul. 16, 1980, Ser. No. 169,339
Claims priority, application Italy, Feb. 11, 1980, 67200 A/80
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—734 **8 Claims**



1. In a device for the insertion of pre-wound coils into the slots of a stator of a rotary electric machine, of the type comprising:

a cylindrical finger holder having on its periphery an annular series of longitudinal grooves, and

an annular series of fingers around said finger holder, each finger being received in one of said grooves and extending beyond one end of said finger holder to receive thereon said pre-wound coils,

the improvement wherein:

the other end of said cylindrical finger holder opposite to said one end from which said fingers project, has an end portion extending axially beyond said fingers,

angular orientation reference means are provided on said other end portion of said finger holder for cooperating with the slots of a stator whereby to obtain the correct angular orientation of said annular series of fingers with respect to said stator slots when said other end portion of said finger holder is inserted into a stator, and

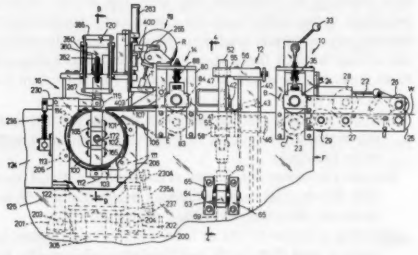
means are provided for effecting axial displacement of said finger holder, with the said other end portion as the leading end, after said other end portion has been introduced into a stator, whereby to cause said fingers to be drawn through said stator by said finger holder to draw pre-wound coils carried on said fingers into said stator slots.

4,291,460

APPARATUS FOR PROVIDING TAPED COILS OF SHEET MATERIAL

Herbert M Stoehr, 21860 MacGregor Dr., New Berlin, Wis. 53151

Division of Ser. No. 930,888, Aug. 4, 1978, Pat. No. 4,235,384. This application Jul. 9, 1980, Ser. No. 167,349
Int. Cl.³ B65B *63/04*
U.S. Cl. 29—820 **6 Claims**



1. Apparatus for forming a taped coil from a web of sheet material comprising:

a web feed mechanism;

a web shear mechanism through which said web is fed;

a coil taping mechanism;

a coiling mechanism into which said web is fed after passing through said web shear mechanism, said coiling mechanism including a rotatable expandable and contractable mandrel, said mandrel being expanded at the commencement of and during winding and being contractable after winding is completed, web guide means for receiving the incoming leading edge of said web and including adjustably positionable hold-down plates adjacent said mandrel and adjustably positonable guide plates disposed around said mandrel to initiate coil winding, adjustably positionable cage rollers disposed around said mandrel to engage a coil being wound to ensure tightness, mandrel support means located below said mandrel for supporting said mandrel, and ejector means for axially moving a coil off said mandrel;

and control means to effect operation of said mechanisms whereby coil winding is initiated and when a predetermined length of web is wound into coil, the web feed mechanism is momentarily stopped, the web shear mechanism operates to sever said web, the coil is taped, the web guide means, the cage rollers and the mandrel support means are moved out of interfering relationship with said coil, said mandrel is stopped and contracted, and the

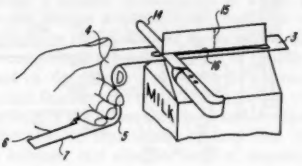
ejector means operates to move the taped coil off said mandrel.

4,291,461

KNIFE GUIDE DEVICE FOR OPENING OF MILK AND SOFT DRINK PAPER CARTONS

Val Hansen, P.O. Box 18364, Denver, Colo. 80218

Filed Aug. 24, 1979, Ser. No. 69,608
Int. Cl.³ B67B *7/00*
U.S. Cl. 30—2 **5 Claims**



1. A guide adapted for use with a knife, said guide and knife adapted to cut open a portion of a flange of a paper carton containing consumable fluids, said paper carton flange adapted to open and form a portion of a pouring spout comprising in combination:

first guide means for marking off one of two predetermined distances along said flange, said first guide means further providing an edge along which said knife can make a first cut through said flange;

second guide means for forming a surface along which said knife is directed, said second guide means rigidly connected to said first guide means, said second guide means adapted to direct said knife in making a second cut through a portion of said flange, said second cut being perpendicular to and intersecting said first cut; and

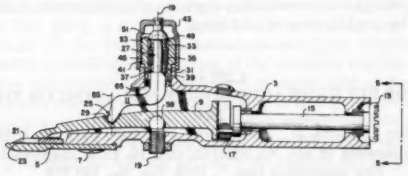
retaining means for retaining said second guide means in a fixed position while said second cut is made, said retaining means integrally connected to said second guide means.

4,291,462

SHEARING DEVICE

E. E. Corder, Lakewood, Colo., assignor to A.S.M., Inc., Denver, Colo.

Filed Apr. 14, 1980, Ser. No. 140,172
Int. Cl.³ B26B *19/00*
U.S. Cl. 30—221 **7 Claims**



1. An animal shearing device comprising:

a hollow handpiece,

a comb member having a substantially planar surface,

means for rigidly mounting said comb member to said handpiece,

a rigid, elongated arm having first and second ends,

a cutter member,

means for mounting said cutter member to said elongated arm adjacent said first end thereof,

means for mounting said elongated arm substantially midway between said first and second ends and within said hollow handpiece for pivotal movement about first and second intersecting and perpendicular pivotal axes with said cutter member in sliding engagement with the planar face of said comb member whereby pivotal movement of said elongated arm about aid first pivotal axis reciprocally moves said cutter member along an arcuate path across the planar face of said comb member, said first pivotal axis being perpendicular to said planar face of said comb and said second axis being parallel to said planar face of said comb member, and,

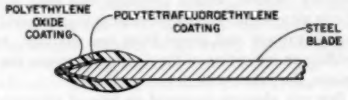
means for selectively adjusting the pressure with which the cutter member engages the planar face of said comb member, said adjusting means including a tensioning arm with first and second ends and means for mounting said tensioning arm for pivotal movement about an axis colinear with said first pivotal axis with said first end of said tensioning arm abutting said elongated arm at a predetermined, fixed location between said first pivotal axis and said first end of said elongated arm, said tensioning arm mounting means further including means for selectively, bodily moving said tensioning arm between at least first and second positions with said first end of said tensioning arm being closer to said planar face of said comb member in said first position than in said second position to selectively increase and decrease the pressure with which the cutter member engages the planar surface of said comb member and means for limiting the pivotal movement of said tensioning arm at said first and second positions to about said first pivotal axis.

4,291,463

WATER-SOLUBLE SHAVING AID FOR RAZOR BLADES

Peter S. Williams, Stratford, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 31, 1979, Ser. No. 108,743
Int. Cl.³ B26B *21/00*
U.S. Cl. 30—346.53 **7 Claims**



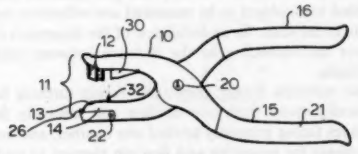
1. A razor blade having an adherent solid, water-soluble coating comprising polyethylene oxide.

4,291,464

LID PIERCING DEVICE

Ernest R. Garrett, P.O. Box 3308, Granada Hills, Calif. 91344

Filed Jun. 25, 1979, Ser. No. 51,703
Int. Cl.³ B26F *1/00*
U.S. Cl. 30—363 **4 Claims**



1. A punch assembly for piercing a thin disc-like frangible member including a hollow upstanding rim edge defining an edge groove comprising:

a male die including at least one punch;

a female die including at least one opening mating with said punch;

means securing said male and female dies for closing move-

ment about a pivot point and defining a jaw-like opening; and

a guide secured to one of said dies extending into the region between said dies and positioned within said jaw-like opening between said punch and said pivot and adapted to extend into the edge groove of the hollow edge rim of a thin disc-like frangible member to be pierced;

stop means secured to the opposite one of said dies from said guide and extending into said jaw-like opening;

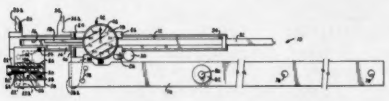
said guide and stop means cooperating to limit the insertion of the frangible member into the punch assembly to position said thin disc-like frangible member for piercing by said die punch assembly.

4,291,465

CALIPER RULE DEVICE HAVING EXTENDED MEASUREMENT RANGE

Arley C. Hemeyer, 8201 W. 78th Pl., Overland Park, Kans. 66204

Filed Feb. 7, 1980, Ser. No. 119,459
Int. Cl.³ G01B 5/02
U.S. Cl. 33—143 M **7 Claims**



1. In a caliper rule device having a rule member carrying a first measurement element, a slide member carrying a second measuring element, means coupling said slide member with said rule member for sliding movement to move said measuring elements toward and away from one another, and a scale providing an indication of the distance between the measuring elements, the improvement comprising:

a first pin element mounted to one of said rule and slide members;

an elongate bar mounted to the other of said rule and slide members, said bar having a length dimension oriented generally parallel to the direction of movement of the slide member;

a second pin element;

means for mounting said second pin element to said bar at a plurality of locations which are spaced along the length of said bar in a manner effecting a predetermined relationship between the indication provided by the scale and the distance between said pin elements at each location of the second pin element, whereby the pin elements may be applied to an object to be measured and reference may be made to the scale for an indication of the dimension of the object corresponding to the distance between said pin elements;

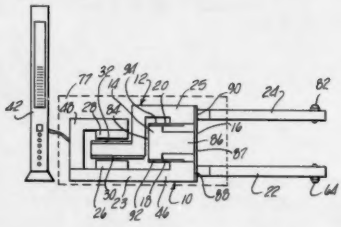
said pin elements having outwardly facing surfaces facing generally away from one another and inwardly facing surfaces facing generally toward one another, and including means for mounting said first pin element to said one member at a pair of spaced apart positions which are located such that the distance between said outwardly facing surfaces has a predetermined relationship to the indication provided by the scale when said first pin element is in one of said pair of positions, and the distance between said inwardly facing surfaces has a predetermined relationship to the indication provided by the scale when said first pin element is in the other of said positions.

4,291,466

TRANSDUCER FOR MEASURING WORKPIECES

Seymour Bell, Southfield, and Richard O. Juengel, Romeo, both of Mich., assignors to The Valeron Corporation, Troy, Mich.

Filed Sep. 14, 1979, Ser. No. 75,573
Int. Cl.³ G01B 7/12
U.S. Cl. 33—148 H **8 Claims**



1. A caliper-type transducer for measuring dimensions of a workpiece comprising:

first and second rigid arms, each having a caliper end and a transducer end;

pivot means comprising a pivot block and spring means connected to said pivot block for frictionlessly interconnecting said first and second arms mediate their ends to limit the relative movement of said arms to complemental displacement toward and away from each other within a measurement plane;

said spring means further including at least one transverse spring means interconnecting said arms to a portion of the pivot block, said transverse spring means being compliant only to movement of said arms within the measurement plane in the direction parallel to the arms; and at least one parallel spring means interconnecting said arms to another portion of the pivot block wherein said parallel spring means is compliant only to movement of said arms within the measurement plane in the direction perpendicular to the arms;

the transducer end of the first arm carrying first and second opposing transducing elements spaced apart in said measurement plane;

the transducer end of the second arm being disposed mediate the transducing elements to complementally vary an electrical characteristic thereof with displacement therebetween; and

sensing means electrically connected to the transducing elements for producing a signal related to the differential change in electrical characteristics of said elements caused by displacement of said arms.

4,291,467

GUIDE RULE FOR AUTOMOBILE MOULDING OR THE LIKE

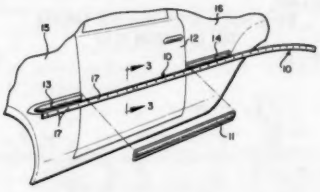
William L. Shultz, Jr., 732 N. Third Ave., Villa Park, Ill. 60181

Continuation of Ser. No. 950,151, Oct. 10, 1978, abandoned.
This application Dec. 7, 1979, Ser. No. 101,278
Int. Cl.³ G01B 3/14, 3/10
U.S. Cl. 33—177 **5 Claims**

1. A guide rule for aligning a protective side moulding, or the like, along a metallic surface such as a side panel of a vehicle, or the like, in a substantially rectilinear orientation thereby to facilitate the securing of the moulding thereto, said guide rule comprising; an elongate strip of flexible magnetic material, and an elongate strip of spring steel material fixedly secured to said flexible strip in surface-to-surface engagement along substantially the entire length of said elongate strip of magnetic material so that relative lateral and longitudinal movement between said elongate strip of magnetic material and said strip of spring steel material is precluded, said metal strip having at least one edge which extends beyond the adja-

cent side edge of said flexible strip for the entire length of said metallic strip said flexible magnetic strip providing means for securely attaching the guide rule to the side panel, and said metallic strip edge providing a continous rigid, rectilinear support surface for the side moulding, with the construction of said metallic strip from flexible spring steel and the fixed securement of said spring steel strip to said strip of flexible magnetic material providing means which force the guide rule into a substantially rectilinear orientation when the elongate strip of flexible magnetic material is in surface-to-surface contact with a metallic surface.

2. A guide rule for aligning a protective side moulding, or the like, along a metallic surface such as a side panel of a vehicle, or the like, in a substantially rectilinear orientation thereby to facilitate the securing of the moulding thereto, said guide rule comprising; an elongate strip of flexible magnetic material, and an elongate strip of spring steel material fixedly secured to said flexible strip in surface-to-surface engagement along substantially the entire length of said elongate strip of magnetic material so that relative lateral and longitudinal movement between said elongate strip of magnetic material and said strip of spring steel material is precluded, said metal strip having at least one rectilinear edge, which edge extends at least to the corresponding edge of the flexible magnetic strip, said flexible strip and said metallic strip include a plurality of aligned and equally spaced apertures along the length of said strips for providing means for locating the position of holes to be drilled into the side panel adapted to receive securing means which secure the side moulding to the side panel said flexible magnetic strip providing means for securely attaching the guide rule to the side panel, and said metallic strip edge providing a continuous rigid, rectilinear support surface for the side moulding, with the construction of said metallic strip from flexible spring steel and the fixed securement of said spring steel strip to said strip of flexible magnetic material providing means which force the guide rule into a substantially rectilinear orientation when the elongate strip of flexible magnetic material is in surface-to-surface contact with a metallic surface.



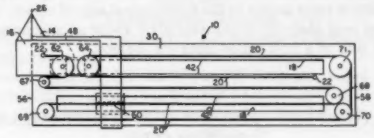
3. A guide rule for aligning a protective side moulding, or the like, along a metallic surface such as a side panel of a vehicle, or the like, in a substantially rectilinear orientation thereby to facilitate the securing of the moulding thereto, said guide rule comprising a continuous elongate strip of flexible magnetic material, and an elongate strip of spring steel material fixedly secured to said flexible strip in surface-to-surface engagement along substantially the entire length of said elongate strip of magnetic material so that relative lateral and longitudinal movement between said elongate strip of magnetic material and said strip of spring steel material is precluded, said elongate strip of flexible magnetic material extending across the width of said strip of spring steel material, but not beyond the edges of said spring steel strip, said spring steel strip having at least one rectilinear edge, which edge extends at least to the corresponding edge of the flexible magnetic strip, said flexible magnetic strip providing means for securely attaching the guide rule to the side panel, and said metallic strip edge providing a continuous rigid, rectilinear support surface for the side moulding, with the construction of said metallic strip from flexible spring steel and the fixed securement of said spring steel strip to said strip of flexible magnetic material providing means which force the guide rule into a substantially rectilinear orientation when the elongate strip of flexible magnetic material is in surface-to-surface contact with a metallic surface.

4,291,468

MECHANICAL POINT LOCATOR

Earl C. Follett, Walnut Creek, Calif., assignor to Measurematic Development Company, San Francisco, Calif.

Filed Mar. 10, 1980, Ser. No. 128,575
Int. Cl.³ B25H 7/00
U.S. Cl. 33—192 **18 Claims**



1. A mechanical point locator and distance divider for locating a second distance which is a fixed integral fraction of a first distance, comprising:

a base having a starting end and a finishing end;

a leading indicator and a trailing indicator, both slidably mounted for movement along the length of the base, the leading indicator being toward the finishing end;

trailing indicator pulley means secured to the trailing indicator;

said starting end of the base having first pulley means secured thereto and said finishing end of the base having second pulley means;

first cord means for moving the trailing indicator said fixed integral fraction of the distance moved by the leading indicator, in the same direction as the leading indicator as it is advanced toward the finishing end of the base, said first cord means being fixed to the leading indicator and then passing around the trailing indicator pulley means, and further being associated with the trailing indicator and the finishing end of the base such that the cord means forms an integral number of generally parallel runs, the integral number being the reciprocal of said integral fraction, whereby the trailing indicator moves at said integral fraction of the rate of the leading indicator; and

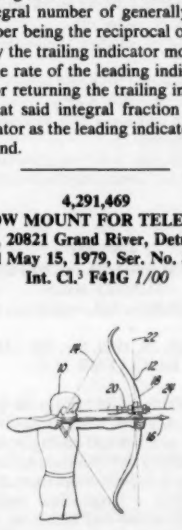
return means for returning the trailing indicator toward the starting end at said integral fraction of the rate of the leading indicator as the leading indicator is moved toward the starting end.

4,291,469

ARCHERY BOW MOUNT FOR TELESCOPIC SIGHT

Norman J. Weast, 20821 Grand River, Detroit, Mich. 48219

Filed May 15, 1979, Ser. No. 39,110
Int. Cl.³ F41G 1/00
U.S. Cl. 33—265 **3 Claims**



1. Means for mounting an elongated telescopic sight on the side of an archery bow comprising:

a telescopic sight;

a base plate;

a plurality of first fastening means for fastening the base plate

to the side of the midsection of an archery bow having a longitudinal axis;

first ring means fastened to said base plate for receiving an elongated telescopic sight;

said base plate being on one side of the first ring means and said telescopic sight being positioned on the opposite side of the first ring means; and

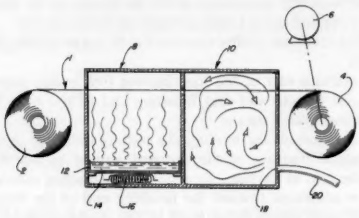
second ring means spaced from the first ring means generally along the axis of the telescopic sight and directly cooperating with the first ring means to support the telescopic sight such that the longitudinal axis of the sight is generally at right angles to the longitudinal axis of a bow, means on said plate for tilting said plate about an axis normal to a side of a bow when installed thereon.

4,291,470

METHOD FOR PRESHRINKING SEMIPERMEABLE MEMBRANES

Ferris E. Newman, Burlington, Vt., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 25, 1979, Ser. No. 42,367
Int. Cl.³ F26B *1/00*
U.S. Cl. 34—12 **10 Claims**



1. A method of treating cellulose semi-permeable membranes, of the type used in coil dialyzers, so as to minimize shrinkage of the membrane during sterilization of the dialyzer, the method including the steps of:

providing a supply of cellulose semi-permeable membrane material;

transporting said material from said supply through a humidity chamber maintained at a very high relative humidity, at a temperature and for a time effective to permit said material to relax; and

passing said material into a drying chamber in which warm air is circulated for permitting the membrane material to shrink.

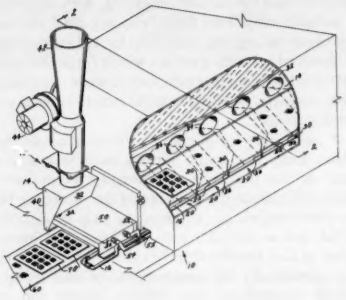
4,291,471

EXHAUST SYSTEM AND METHOD FOR VENTING A TUNNEL KILN

Terry R. Bloom, Middlebury, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Mar. 20, 1980, Ser. No. 132,093
Int. Cl.³ F26B *21/00*
U.S. Cl. 34—12 **10 Claims**

1. A lateral exhaust manifold system for purging contaminated atmosphere from a kiln, comprising a longitudinal duct disposed on one side of a kiln and having a plurality of spaced apart apertures, a plurality of cones each having a large diameter end circumposing a respective aperture, an exhaust means connected to said duct, a longitudinal input tube disposed opposite and laterally across said kiln from said longitudinal duct and having spaced apart jets disposed oppositely from said apertures means for forcibly emitting a medium under pressure from said jets whereby said medium moves laterally and turbulently across said kiln which is maintained under slight superatmospheric pressure, said contaminated air being vented together with contaminants through said cones spaced along the length of said kiln and said longitudinal duct by the exhaust means, and a gaseous barrier disposed at the entrance



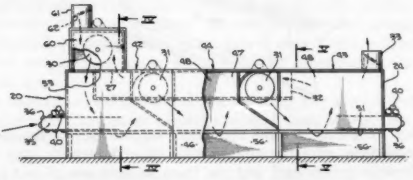
and exit of said kiln to prevent external atmosphere from entering said kiln.

4,291,472

DRYING APPARATUS FOR AQUEOUS COATED ARTICLES AND METHOD

Philip J. Lewis, Corona, Calif., assignor to Brogdex Company, Pomona, Calif.

Filed Sep. 8, 1978, Ser. No. 940,754
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—31 **8 Claims**



1. In a method of drying aqueous coatings on articles such as fruit and the like, the steps of:

providing a substantially closed chamber having a conveyor path of selected width along which one or more layers of articles are advanced with aggregate area of openings through said conveyor path and article layer being in the order of 10% to 25% of the total area of said path in said chamber;

transversely directing heated air into the bottom of said chamber at a selected flow rate below said path to pass the heated air through said openings to chamber space above said path;

removing air in a transverse direction from the chamber space above said path at a flow rate substantially the same as the flow rate of air directed into said chamber below said path, while maintaining a selected pressure in said chamber below said path;

whereby passage of heated air through said openings and about said articles over the total area of said path in said layer is substantially uniform;

intermixing part of the air removed from the chamber space above said path with fresh air to provide desired humidity and temperature of the air mixture;

and directing the intermixed air into said closed chamber below said path.

4,291,473

SKI BOOT DEVICE FOR FACILITATING WALKING

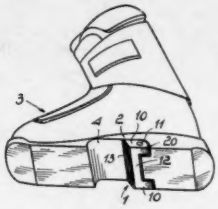
Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Nov. 2, 1979, Ser. No. 90,817

Claims priority, application Italy, Nov. 15, 1978, 23292/78[U]; Jun. 13, 1979, 21828/79[U]

Int. Cl.³ A43B 5/00

U.S. Cl. 36—132 **11 Claims**



3. A ski boot device for facilitating walking, comprising a profiled member for connection to a sole of a ski boot between a front portion of said sole and a heel portion of said sole, wherein said profiled member comprises a substantially cylindrical element housed in a seat provided in said sole between said front portion and said heel portion and rotatable about a pin substantially perpendicular to a base of said seat, said cylindrical element having a geometric axis and a lower face substantially perpendicular to said geometric axis and an upper face inclined with respect to said geometric axis, said cylindrical element being selectively positionable in a first position in which said lower face is in line with said sole, and in a second position in which at least a part of said cylindrical element projects beyond said sole.

4,291,474

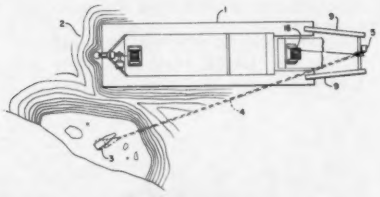
DREDGE SWELL COMPENSATOR APPARATUS

Frederick J. Schmidt, 5208 N. Marietta Dr., Mobile, Ala. 36618

Filed Sep. 10, 1979, Ser. No. 74,379

Int. Cl.³ E02F 3/88, 3/90

U.S. Cl. 37—67 **6 Claims**



1. A waterborne dredge compensating system for maintaining a uniform grade comprising:

a. a shore mounted laster for projecting a horizontal beam of radiant energy, said horizontal beam establishing a reference plane of known elevation;

b. a photo receiver having a plurality of vertically arranged photo sensitive arrays, said photo receiver being mounted on a waterborne dredge and being so oriented that said horizontal beam of radiant energy impinges on said photo receiver;

c. a dredge ladder having one end mounted on said waterborne dredge such that said ladder is vertically moveable and having a dredge cutter mounted on its other end;

d. a hydraulic system, activated by output signals from said photo receiver, mounted on said waterborne dredge;

e. a winch mounted on said dredge;

f. an A-frame, mounted on said waterborne dredge, supporting a block and tackle assembly, said block and tackle assembly including a first pulley block having a flat horizontal upper plate; and

g. a vertical support rod, said vertical support rod having its bottom end secured to said flat horizontal upper plate of said first pulley block and wherein said photo receiver is secured to the top end of said vertical support rod, whereby said photo receiver moves up and down when said first pulley block moves up and down, respectively.

4,291,475

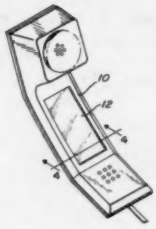
LABELLING DEVICE

Hans L. Schoemer, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 4,251, Jan. 18, 1979, abandoned, which is a continuation of Ser. No. 799,053, May 20, 1977, abandoned. This application May 8, 1980, Ser. No. 147,796

Int. Cl.³ G09F 3/20

U.S. Cl. 40—338 **3 Claims**



1. A device for providing an alterable directory of telephone numbers for a telephone set having a handset, said device disposed on the underside of the handset of the telephone set, said directory device comprising:

said handset including a recessed area on the underside surface thereof, said recessed area having at least a pair of slots each including a circular post and spatially disposed on opposite sides of the recessed area;

a directory label insertable into the recessed area of the handset for providing an alterable directory of at least two telephone numbers thereupon; and

a flexible, transparent shield, having a thickness of at most 0.01 1 inches, insertable into the recessed area for covering and retaining the directory label, said shield having at least a pair of tangs, each tang having a notch with a pair of lips, the lips of each notch defining a narrow opening to the respective notch which is wider therewithin, said shield fixedly retained in the recessed area of the handset by the notches of the tangs which each insert into corresponding slots where the respective notch engages the post therewithin, the lips of each notch partially wrapping around the corresponding post for retaining the transparent shield and directory label within the recessed area.

4,291,476

SIGHT RAIL FOR SHOULDER FIREARMS

Otto Repa, Oberndorf, Fed. Rep. of Germany, assignor to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Mar. 29, 1979, Ser. No. 25,272

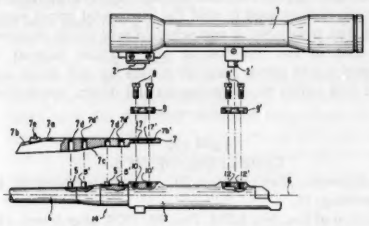
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1978, 7810514[U]

Int. Cl.³ F41G 1/38

U.S. Cl. 42—1 ST **5 Claims**

1. A device for securing a sighting telescope to a shoulder firearm, which firearm includes a receiver having a barrel secured thereto, and with a plurality of upright internally threaded, hollow, tubular mounting bolts disposed along the length of the receiver and barrel at spaced locations, compris-

ing, a sight rail having an underside conformable to the receiver and the barrel and disposed to overlie at least a portion of each and having a top surface with at least one sighting



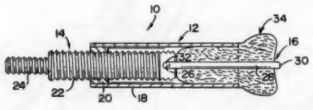
telescope and sight mount dovetailed recess defined thereon, and a plurality of bores opening downwardly in said sight rail into which the mounting bolts extend.

4,291,477

GUN BARREL CLEANING DEVICE

Guy L. Carlton, 1294 Bellaire Ct., Naples, Fla. 33940

Filed May 7, 1979, Ser. No. 36,357
Int. Cl.³ F41C *31/00*
U.S. Cl. 42—1 BC **7 Claims**



1. A gun barrel cleaning device for use with a cleaning rod comprising a compression sleeve having a coupling insert formed in one end thereof, a coupling member at least partially disposed within said compression sleeve to operatively engage said coupling insert, said coupling insert comprises an internally threaded coupling insert and said coupling member comprises an enlarged externally threaded portion to operatively engage said internally threaded coupling insert, said coupling member having a first and second attachment element formed on opposite ends thereof, said first attachment element to affix the gun barrel cleaning device to a cleaning rod and said second attachment element to affix a retaining member to retain a spongeous cleaning element to said gun barrel cleaning device wherein said coupling member and said retaining member are adjustable longitudinally relative to said compression sleeve to selectively compress the spongeous cleaning element between one end of said compression sleeve and said retaining member.

4,291,478

INFRARED AIMING LIGHT MOUNTING BRACKET FOR WEAPON

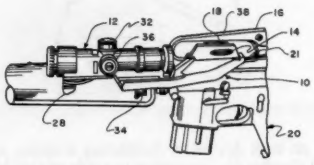
Lewis E. Lough, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 26, 1979, Ser. No. 97,614
Int. Cl.³ F41G *1/36*
U.S. Cl. 42—1 A **4 Claims**

1. An infrared aiming light mounting bracket for conveniently mounting and dismounting an infrared aiming light to a weapon wherein the weapon operator may selectively activate said infrared aiming light while continuously bracing the weapon handle, said infrared aiming light mounting bracket comprising:

a weapon end of said mounting bracket having a three point-mounting arrangement therein in which said weapon end is comprised of a bracket shoe having a front pad and a rear pad and relief areas between said front and rear pads wherein said bracket shoe is compatible with the foot of a weapon handle and a tapered thumb screw locking pin and a thumb wheel that is threadably connected to said tapered thumb screw locking pin to extend and lock said tapered thumb screw locking pin firmly into a hole in the upper half of the weapon handle wherein the tapered portion of said tapered thumb screw locking pin forms one point of said three point-mounting arrangement and wedges said mounting bracket firmly against the weapon handle at said front and rear pads wherein said front and rear pads form the other two points of said three point-mounting arrangement;

an aiming light end of said mounting bracket comprised of an aiming light shoe compatible with an IR aiming light



foot, and a screw threadable means that is screw threadably connected into said IR aiming light foot to firmly set said IR aiming light into said aiming light end of the mounting bracket; and

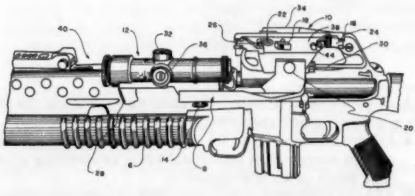
an angular offset portion of said mounting bracket that extends forward and downward from said weapon end to said aiming light end of the mounting bracket wherein said IR aiming light has a dead man switch placed in the proximity of the weapon handle bracing hand of the weapon operator so that the thumb of the bracing hand of said weapon operator may selectively activate said IR aiming light by use of said thumb against said dead man switch while continuously bracing said weapon at said weapon handle.

4,291,479

DAY-NIGHT SIGHT MOUNTING BRACKET FOR WEAPON

Lewis E. Lough, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 26, 1979, Ser. No. 97,615
Int. Cl.³ F41G *1/36*
U.S. Cl. 42—1 A **3 Claims**



1. A day-night sight mounting bracket for a grenade launcher type weapon in which said weapon may be used for both daytime operation and nighttime operation wherein an infrared aiming light used for nighttime operation is positioned so that weapon operator may selectively activate said infrared aiming light while continuously bracing the weapon handle, said day-night sight mounting bracket comprising:

a locking bracket that is compatibly fit and rigidly mounted into the weapon handle of said weapon in a three point-

mounting arrangement and having an elevation-range index plate mounted on the front portion thereof and a pivot point threaded hole in the rear portion thereof wherein said locking bracket is comprised of a locking bracket shoe having a front pad and a rear pad with a relief area therebetween which is fit into a foot of said weapon handle and a tapered thumb screw locking pin that is screw threadably connected to a thumb wheel to extend and lock said tapered thumb screw locking pin firmly into a hole in the upper half of the weapon handle in which the tapered portion of said tapered thumb screw locking pin forms one point of said three point-mounting arrangement and wedges the mounting bracket firmly against the weapon handle of said front and rear pads wherein said front and rear pads form the other two points of said three point-mounting arrangement;

a pivot plate pivotably connected at a common pivot point with the pivot point threaded hole in said locking bracket wherein said pivot plate is comprised of flip-out peep-hole and sighting-post day-night sights and an open sighting window on the front section thereof for directly viewing selected elevation and ranges from said elevation-range index plate on said locking bracket as said pivot plate is pivoted about said locking bracket and a smooth bore pivot pin hole in the rear portion thereof and an outer raised area pivot plate foot with a threaded screw hole therein; and

an infrared aiming light adapter bracket comprised of a pivot plate end of said adapter bracket having a pivot plate shoe with a threaded hole through the base thereof in which said pivot plate shoe is compatible with the outer raised area pivot plate foot wherein a captivating thumb screw having a smooth stem within said pivot plate shoe and threads on the end of said stem that are threadably connected within said threaded screw hole in said raised area pivot plate foot and an aiming light end of said infrared aiming light adapter bracket having an aiming light shoe that is compatible with an infrared aiming light foot mounted thereon wherein a captivating lever screw assembly screw threadably connects said infrared aiming light foot into said infrared aiming light shoe of said adapter bracket and an angular offset forward and downward portion of said infrared aiming light adapter bracket extends from said pivot plate end to said aiming light end wherein a dead man switch on said infrared aiming light is in the proximity to the weapon handle bracing hand of the weapon operator so that the thumb of the bracing hand may selectively activate said infrared aiming light by use of said thumb against said dead man switch while continuously bracing said weapon at said weapon handle.

4,291,480

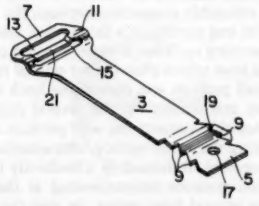
INTERACTING LEAF SPRINGS

Daniel D. Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Continuation-in-part of Ser. No. 3,664, Jan. 15, 1979, Pat. No. 4,258,495. This application Oct. 12, 1979, Ser. No. 84,623

Int. Cl.³ F41C *25/02*; F16F *1/22*

U.S. Cl. 42—50 **19 Claims**



18. In a cartridge magazine in combination: a casing for storing cartridges, said casing including a floor and an exit port; a follower slideable in said casing and adapted for urging said cartridges toward said port; an interacting spring assembly engaging said follower and said floor and comprising; a stack of resilient leaves, each leaf in said stack including: engagement means comprising a plurality of slots extending transversely across a longitudinal axis of said leaf; lever means; fulcrum means; activation means; and detent means.

4,291,481

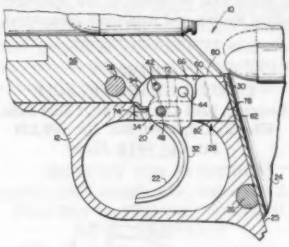
FIREARM MAGAZINE SAFETY MECHANISM

Robert L. Hillberg, Cheshire, Conn., assignor to Wildey Firearms Company, Inc., Cold Spring, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,906

Int. Cl.³ F41C *17/08*

U.S. Cl. 42—70 A **16 Claims**



1. In a firearm having a frame including a magazine well, a magazine releasably retained in the well, a firing mechanism movable between cocked and released positions, a trigger mechanism for releasing the firing mechanism from a cocked position and including a trigger, means supporting the trigger for movement between forward and rearward positions respectively corresponding to cocked and released positions of the firing mechanism, and means for disabling the trigger mechanism to prevent it from releasing the firing mechanism from a cocked position when the magazine is removed from the well, the improvement comprising said trigger having an opening therethrough, said disabling means including a disabling member supported for movement within said opening and relative to said trigger and said frame between safety and off positions, said means for supporting said trigger comprising means for retaining said disabling member, said disabling member in its safety position preventing operation of said trigger mechanism to release said firing mechanism, said disabling member in its off position permitting operation of said trigger mechanism to release said firing mechanism, said disabling member being movable to its off position in response to insertion of a magazine into said magazine well.

4,291,482

STABILIZING ATTACHMENT FOR HAND GUN

Joseph R. Bresan, 207 Baywood Dr., Fishing Creek, Cape May, N.J. 08204

Filed Nov. 23, 1979, Ser. No. 96,634

Int. Cl.³ F41C *23/00*

U.S. Cl. 42—72 **11 Claims**

1. On a firearm, as held in the firing position with a butt having two lateral sides with handgrips comprising the combined grips shaped to fit the hand for holding and aiming the firearm, a stabilizing attachment comprising:

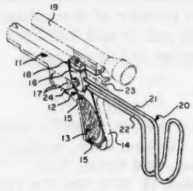
(a) a vertical extension of one of the grips, extending from the top of the grip,

(b) at least two horizontal apertures extending front to back through the vertical extension,

(c) two horizontal members slidably fitting in the apertures of sufficient length to reach from the vertical extension to the forearm of the person holding the firearm,

(d) an upright "U" shaped support means rigidly connected

to the rear extremity of the two horizontal members of a shape to cup and support the forearm from below, and



(e) a securing means for hand releasably securing and holding the horizontal members in the apertures both as to longitudinal sliding and rotational movement.

4,291,483

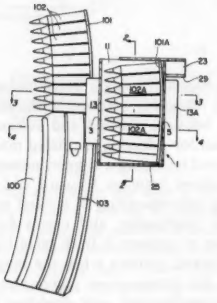
CARTRIDGE RECEPTACLE

Daniel D. Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Jan. 2, 1980, Ser. No. 109,129

Int. Cl.³ F42B *39/06*

U.S. Cl. 42—87 **9 Claims**



1. A receptacle adapted for containing at least one clip of cartridges, said receptacle including: magazine engagement means; and external clip support means.

4,291,484

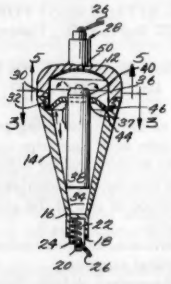
ILLUMINATED FISHING FLOAT

Earlwood Young, 8617 Trevarthon Rd., Orlando, Fla. 32807

Filed Sep. 6, 1978, Ser. No. 940,149

Int. Cl.³ A01K *93/00*

U.S. Cl. 43—17.5 **7 Claims**



1. In a fishing float of the type comprising:

a body adapted for partial submersion in water, said body including a frustro-conical lower shell having a vertex at one end, an upper shell, and means for effecting a removable watertight mating between said upper shell and the end of said lower shell opposite said vertex, said mating forming a watertight cavity in the interior of said body, each of said upper and lower shells including light-passing portions;

said float further comprising support means, adapted for receiving a pen-light, for removably fixing said pen-light in said cavity whereby a beam of light produced by said pen-light is directed towards said upper shell to illuminate said upper shell light-passing portion and a reflector disposed in said upper shell to direct light through said lower shell light-passing portion, the improvement wherein:

said support means comprises a support member having a central aperture for receiving said pen-light, a peripheral portion at least partially formed of a resilient material for engaging said body and at least one transparent portion disposed to pass reflected light to said lower shell light-passing portion; and

said means for effecting a removable watertight mating comprises respective corresponding threaded portions on said upper and lower shells, said threaded portions cooperating to engage said support member resilient peripheral portion between said upper and lower shells to effect a watertight seal between said upper and lower shells.

4,291,485

AUTOMATICALLY RELEASING MOUNTING SYSTEM FOR A WEIGHT MEMBER

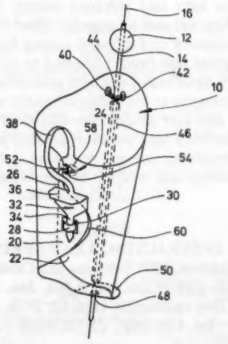
Josef Koller, Au am Aigen 3, D 8077 Reichertshofen, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,612

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 7719362[U]

Int. Cl.³ A01K *91/00*

U.S. Cl. 43—43.12 **9 Claims**



1. A receptacle adapted to receive a weight member to provide for a releasable connection between the weight member and the free end portion of a fishing-line, comprising wall portions cooperating to define a variable outlet opening, comprising pivotal joint means allowing for pivotal relative movement of the wall portions and comprising latch means spaced from the pivot axis defined by the pivotal joint means and adapted to releasably connect the wall portions and to disengage upon hitting the water surface, characterized in that the wall of the receptacle is formed by a resiliently flexible sheet, having free end portions interconnected at the upper ends thereof by the pivotal joint means, in that the latch means associated to the lower ends of the free end portions include a latch-catch formed on one of the free end portions, an opening formed on the other of the free end portions and adapted to receive the latch-catch and a latch member adapted to be

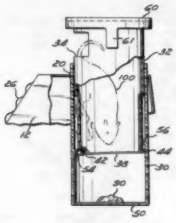
inserted into the latch-catch and having a projecting wing portion, and in that the circumferential distance defined by the latch-catch and the opening is smaller than the effective circumferential extension of the receptacle's transverse cross section taken in a transverse plane including the pivot axis.

4,291,486

RODENT TRAP

Donald C. Lindley, Long Beach, Calif., assignor to Farnam Companies, Inc., Phoenix, Ariz.

Filed Nov. 30, 1979, Ser. No. 98,728
Int. Cl.³ A01M *23/16*
U.S. Cl. 43—61 **8 Claims**



1. A rodent trap comprising:

a pair of telescoping members, each having an open end and a closed end, said open end of one of said members positioned within the open end of the other of said members;

an opening formed in one of said members to permit ingress of a rodent into the region defined between the closed ends of said pair of members;

trigger means mounted to one of said members for releaseably supporting the open end of one of said members at a distance spaced from the closed end of the other of said members; and

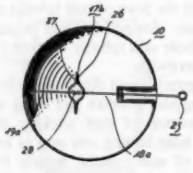
an end cap positioned on the closed end of said one of said members, said end cap sized to cover the open end of said other of said members, said end cap including a pliable gel positioned on one of its surfaces to sealingly engage said open end of said other member for sealing closed said opening and forming a substantially air-tight air lock in said region when said open end of said one of said members is released to collapse said telescoping members together in response to actuation of said trigger means.

4,291,487

INFLATABLE ARTICLE WITH EXTERNAL MEANS TO CONTROL INTERNAL MOVEMENT

Sidney H. Magid, 4th Fl., No. 10, Alley 5, La. 12, Jen Ai Rd., Sec. 4, Taipei, Taiwan

Continuation-in-part of Ser. No. 907,049, May 18, 1978, abandoned. This application Jan. 18, 1979, Ser. No. 4,549
Int. Cl.³ A63H *3/06*
U.S. Cl. 46—88 **14 Claims**



1. An inflatable article including

a thin outer wall made of, at least in part, a flexible, gas impervious, resilient material forming a closed surface, said wall having a valve member attached thereto for inflating said closed surface;

at least one hollow protrusion attached to said wall and having a sealed end and an open end;

at least one movable internal object contained within said closed surface;

a non-elastic connection member attached on one side to the sealed end of said hollow protrusion and attached on the other side to said movable object;

connecting means within said closed surface for connecting said movable object to an inner surface of said wall, said non-elastic connection member and said connecting means serving to suspend said movable object within said closed surface; and

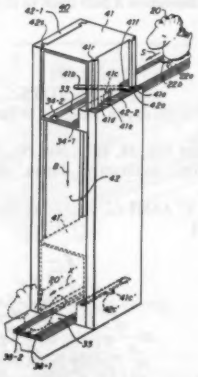
external controlling means connected to the sealed end of said hollow protrusion for imparting and controlling movement to said internal object through said non-elastic connection member, said controlling means extending from said protrusion externally of said closed surface whereby said movable internal object will be moved when the user pulls the said external controlling means with said article in restrained condition.

4,291,488

HOPPITY TOY SYSTEMS

Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044

Filed May 12, 1980, Ser. No. 148,951
Int. Cl.³ A63H *13/00*
U.S. Cl. 46—116 **6 Claims**



1. A hoppity toy system comprising a hoppity toy figure; and means for channelling the motion of said toy in a prescribed way, said figure having feet guided by the channelling means which includes side walls having a height at least equal to but less than three times the height of said feet, and a separation about eight times the height of said feet; wherein the channelling means guides the hoppity toy figure into an auxiliary device, in the form of an elevator including a control lever operated by said hoppity toy figure; said control lever having three distinctive positions.

4,291,489

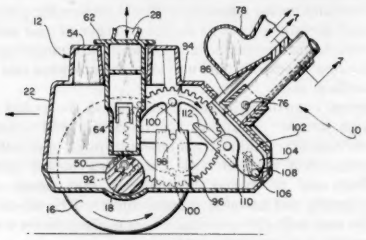
PUSH TOY

Thomas C. McCarthy, Jr., North Providence, R.I., assignor to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Jun. 23, 1980, Ser. No. 162,381
Int. Cl.³ A63H *11/10*
U.S. Cl. 46—205 **6 Claims**

1. A push toy comprising a housing, a generally upright push rod connected thereto, said housing including an axle for supporting wheel means in turn adapted to rotate in contact with a supporting surface as said toy is moved thereacross by

said push rod, a first action element supported by said housing and adapted for reciprocal movement with respect thereto, a second action element supported by said push rod and adapted for reciprocal movement with respect thereto, first activation means associated with said axle for generally continuous moving said first element during movement of said toy and second activation means associated with said axle for intermittently moving said second element during movement of said toy, said



second element slidably mounted on said push rod and including a pin downwardly extending therefrom, said second activation means including spring means having a hammer and adapted for loading by rotation of said wheel means during a portion of a single revolution thereof and release during another portion thereof such that said hammer strikes said pin upon its release so as to abruptly propel said second element up said push rod whereupon it falls back to its original position by gravity.

4,291,490

MOVING TOYS

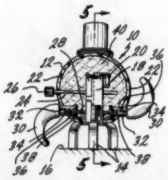
Masaki Ikeda, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Sep. 14, 1979, Ser. No. 75,809

Claims priority, application Japan, Sep. 20, 1978, 53-129058[U]

Int. Cl.[3] **A63H** *17/00, 11/00, 23/10, 3/12*

U.S. Cl. 46—251 **10 Claims**



1. A structure having a body having resilient legs which are adapted to support said body on a surface and means for imparting motion to said body so as to move said body with respect to said surface when it is supported on said surface in which the improvement comprises:

said means for imparting motion including a shaft rotatably mounted on said body so as to be adapted to be rotated about an axis, a motor for rotating said shaft connected to said shaft, at least two members, each of which serves as an inertia mass and a mounting means securing each of said members to said shaft so that said members extend outwardly from said axis of said shaft,

said mounting means permitting the relative positions of both of said members with respect to the axis of said shaft to be independently adjusted so as to vary the forces created during operation of said motor so as to rotate said shaft and said members,

flexible coupling means for use in attaching said body of said structure to a corresponding body of another corresponding structure.

4,291,491

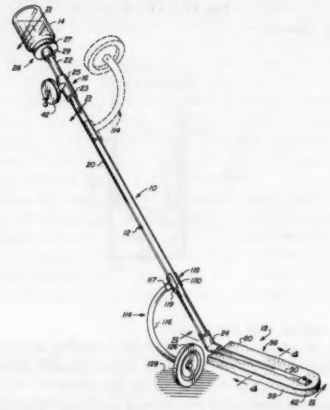
LIQUID HERBICIDE APPLICATOR

Mitchell E. Maddock, P.O. Box 24AA, Florence, Ariz. 85232

Continuation-in-part of Ser. No. 72,147, Sep. 4, 1979. This application Nov. 16, 1979, Ser. No. 94,715

Int. Cl.[3] **A01M** *21/00*

U.S. Cl. 47—1.5 **5 Claims**



1. An applicator for manual application of liquid herbicide to undesired vegetation growing at ground level, said applicator comprising:

(a) a tubular handle of elongated configuration for manual holding at a downwardly and forwardly extending angle which defines an application position;

(b) a vented liquid herbicide supply container means on the end of said tubular handle which is upwardly disposed when said tubular handle is in the application position for supplying liquid herbicide to the bore of said tubular handle;

(c) shutoff valve means in said tubular handle and operable to meter the flow of liquid herbicide from said supply container means to the bore of said tubular handle;

(d) an elongated applicator head extending angularly and forwardly from the other end of said tubular handle so as to lie in a substantially horizontal plane when said tubular handle is in the application position, said applicator head including,

I. an elongated tubular support conduit one end of which is mounted on the other end of said tubular handle and having at least one elongated slot formed longitudinally in the side thereof,

II. an elongated planar wicking element clampingly mounted in the slot of said tubular support conduit so that an elongated liquid absorbing portion thereof is disposed in the bore of said tubular support conduit and at least one elongated liquid wiping portion extends laterally from said tubular support conduit and is coextensive therewith,

III. an elongated liquid dispenser tube in the bore of said tubular support conduit and lying along the liquid absorbing portion of said wicking element, said liquid dispenser tube having one end in communication with the bore of said tubular handle for receiving liquid herbicide therefrom and being longitudinally perforated for evenly distributing the received liquid herbicide along the length of the liquid absorbing portion of said wicking element; and

(e) whereby said wicking element absorbingly receives the

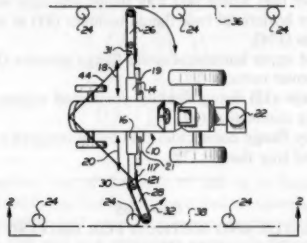
liquid herbicide from said liquid dispenser tube for wiping application thereof on undesired vegetation when said tubular handle is held in the application position and moved so as to swing said applicator head back and forth in a substantially horizontal plane.

4,291,492

TREE SLASHING APPARATUS

Ellis W. Reynolds, and Edward R. Joyce, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,316
Int. Cl.³ A01G *23/10*
U.S. Cl. 47—12 **6 Claims**



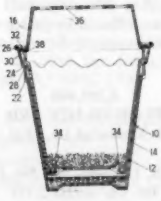
1. A tree slashing and treating apparatus carried by a wheeled vehicle and adapted to move continuously between parallel rows of trees and comprising a pair of oppositely laterally extending telescoping arms secured at their respective proximal extremities to said vehicle, means coacting with each of said telescoping arms for extending and retracting said arms, each of said arms having pivotally secured at its distal extremity chain saw tree slashing means for slashing a tree to remove a strip of bark and exposed an under bark portion of the tree, said chain saw means including an endless saw chain and spaced sprockets mounted respectively on vertical shafts and disposed for movement of the chain around said sprockets in a horizontal plane, means coacting between each of said arms and the respective chain saw means pivotally mounted thereon for restoring said chain saw means from a tree-deflected position to a normal tree-intercepting position after said vehicle has passed a deflecting tree, actuator means and liquid delivery means, respectively carried by each said chain saw tree slashing means said actuator means being vertically displaced from said tree slashing means and adapted to contact the trunk of the tree for causing a liquid treating agent to be applied through said liquid delivery means to said exposed under bark portion.

4,291,493

APPARATUS FOR SPROUTING SEEDS

Eugene Monson, 234 Randolph Dr., Apt. 203D, Madison, Wis. 53717

Filed Jan. 7, 1980, Ser. No. 110,206
Int. Cl.³ A01C *1/00*
U.S. Cl. 47—14 **8 Claims**



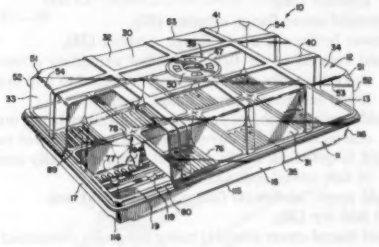
1. An apparatus for sprouting seeds comprising:
an outer container **(12)** of a generally tubular shape provided with an interior nesting stop **(24)** and also provided with a bottom at one end thereof;
an inner container **(14)** of a generally tubular shape provided with an interior **(30)** and an exterior **(28)** nesting stop and also provided with a bottom at one end thereof, the bottom of the inner container **(14)** being perforated with a plurality of openings **(34)**, the inner container **(14)** being received within the outer container **(12)** with the exterior nesting stop **(28)** of the inner container **(14)** engaging the interior nesting stop **(24)** of the outer container **(12)** so that the bottom of the inner container **(14)** is spaced above the bottom of the outer container **(12)** so that water may drain from the inner container **(14)** to the outer container **(12)**;
a cup-shaped dome member **(16)** provided with a rim **(38)** around the edge thereof and arranged so as to be positioned over the other end of the inner container **(14)** with the rim **(38)** engaging the interior nesting stop **(30)** of the inner container **(14)** to form an enclosure in the inner container **(14)** suitable for the sprouting of seeds; and
the exterior nesting stop **(28)** on the inner container provided with a shape so as to allow air flow between the inner and outer containers **(14, 12)**.

4,291,494

INDOOR GREENHOUSE

David J. Knablein, 5264 W. 51st St., Fairview, Pa. 16415, and Chandler D. Rees, 714 Indiana Dr., Erie, Pa. 16505

Filed Aug. 1, 1979, Ser. No. 62,709
Int. Cl.³ A01G *9/24*
U.S. Cl. 47—17 **1 Claim**



1. A greenhouse in combination having
a base **(11)**,
a cover **(12)**, and
trays **(13)**,
said base **(11)** comprising,
base sides **(15, 16)** base ends **(17, 18)**, a base bottom **(19)** and a base flange **(60)**,
said base sides being integrally connected to said base bottom at a curve on a first base radius **(115)**; said base sides and said base ends being integrally connected to each other at a curve on a second base radius **(116)**,
said base ends being integrally connected to said base bottom at a curve on a third base radius **(117)**,
said base sides and said base ends extending upwardly and outwardly from said base bottom **(19)**,
said base bottom **(19)** being corrugated comprising,
transverse valleys **(23)**,
longitudinal base valleys **(20)**,
longitudinal base crests **(21)**,
and base corner crests **(24)** said longitudinal base crests **(21)** having a flat upper surface **(22)**,
each said transverse valley **(23)** being centered on each said crest **(21)**,
said corner crest **(24)** having a flat L-shaped upper surface **(25)**,
said upper flat surface **(22)** of said longitudinal crests and said longitudinal valleys being integrally connected on a fourth radius **(118)**,

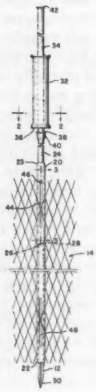
said flat upper surface (22) of said longitudinal crests and said transverse valleys being integrally connected at a fifth radius (119),
said base flange (60) having upper horizontal base flange member (61),
vertical base flange member (62), and
lower horizontal base flange member (63),
said vetical base flange member (62) extending downwardly and outwardly and integrally connected to said upper and lower horizontal base flange members,
said upper horizontal base flange member being integrally connected to said base sides and to said base ends,
said cover (12) being transparent comprising,
a top (30),
cover sides (31, 32),
cover ends (33, 34),
vent (39),
longitudinal cover ribs (40),
lateral cover ribs (41),
and cover flange (35),
said cover sides and said cover ends being integrally connected together at vertical cover corners (52),
said cover sides, and said top being integrally connected together at horizontal cover corners (53),
said top and said cover ends being integrally connected together at lateral cover corners (54),
said vertical cover corner (52),
said horizontal cover corners (53) and said lateral cover corners (54) being integrally connected to triangular cover corner member (51),
said cover flange (35) having upper horizontal cover flange member (36),
vertical cover flange member (37),
lower horizontal cover flange member (38),
said vertical cover flange member extending downwardly and outwardly and integrally connected to said upper and lower horizontal cover flange members,
said upper horizontal cover flange member being integrally connected to said cover sides and to said cover ends,
said longitudinal cover ribs (40) being integrally connected to said cover ends (33, 34),
said upper horizontal flange member (36), and
to said top (30),
said lateral cover ribs (41) being integrally connected to said cover sides (31, 32), to said top (30) and to upper horizontal flange member (36),
said vent (39) being circular and having outer vent rib (43), circular planar vent member (44), planar vent member air flow apertures (45),
vent regulator insert channel (48), and vent regulator (42),
said vent regulator being circular and having planar vent regulator member (50), vent regulator plug (49), vent regulator apertures (46), vent regulator air flow control tab (47),
said vent regulator plug (49) being integrally connected to said planar vent regulator member (50),
said vent regulator plug (49) extending downwardly from said planar vent regulator member (50),
said vent regulator plug (49) being rotatably inserted into said vent regulator insert channel (48),
said trays (13) comprising,
tray sides (71, 72),
tray ends (73, 74), a tray bottom (75) and tray flange (79),
said tray sides being integrally connected to said tray bottom at a curve on a first tray radius (76),
said tray ends being integrally connected to said tray bottom at a curve on a second tray radius (77),
said tray sides and said tray ends being integrally connected at each other at a curve on a third tray radius (78),
said tray sides and said tray ends extending upwardly and outwardly from said tray bottom,
said tray flange being integrally connected to said tray sides and to said tray ends,
said tray bottom (75) having apertures (80) and being corrugated comprising,
longitudinal tray valleys (81), longitudinal tray crests (82),
said longitudinal crests (82) having a flat upper surface (83),
said first tray radius (76), said second tray radius (77) and said third tray radius (78) being integrally connected to triangular tray corner member (84),
said tray flange (79) extending between and sealingly engaging said upper horizontal cover flange member (36) and said upper horizontal base flange member (61),
said lower horizontal cover flange member (38) and
said lower horizontal base flange member (63) being sealingly engaged,
said tray flange being rounded along horizontal tray flange corner (88) where said tray flange sealingly engages said upper horizontal base flange member (61) at second base radius (116),
and said upper horizontal cover flange member (36) at vertical cover corners (52),
said trays (13) being flexibly connected together by tray flange connectors (89),
said tray flange connectors (89) being integrally connected to said tray flanges (79).

4,291,495

APPARATUS AND METHOD FOR DRIVING STAKES

Michael R. Crippen, 1717 223rd SE., Issaquah, Wash. 98027

Filed Apr. 7, 1980, Ser. No. 137,727
Int. Cl.³ A01G *13/10*
U.S. Cl. 47—23 **22 Claims**



1. A removable device for driving a stake through a meshed structure surrounding a seedling or the like, comprising:
means removably threaded through certain mesh openings of the meshed structure for laterally supporting and guiding a stake; and
means for driving the stake through said support and guide means so that a portion of the stake is embedded in the ground and so that, when the said support and guide means are removed, the stake passes through the certain mesh opening and supports the meshed structure.

4,291,496

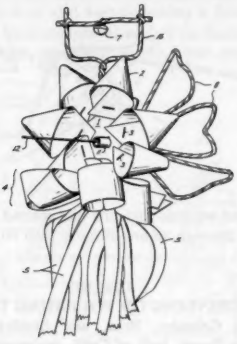
FLOWER HOLDER

Bobbie J. Click, 9900 Memorial Dr., Apt. 232, Houston, Tex. 77024

Filed Feb. 11, 1980, Ser. No. 120,565
Int. Cl.³ A01G *5/00*
U.S. Cl. 47—55 **3 Claims**

1. In a flower holder for use on bouquet backings, a length of light wire bent doubled to form a winged vertical support on

the back of a stiff backing member, the said wire being bent so that the respective ends thereof extend outwardly from the said backing and extend axially through the backing member, a moistener cup mounted horizontally and axially on said



backing member, one of the ends of said wire forming the vertical support being rearwardly bent and terminating in said cup and the other end extending longitudinally and axially through the said cup and extending outwardly therefrom to support the stem of a flower to be mounted on said backing.

4,291,497

METHOD OF INTRODUCING CHEMICAL AGENTS INTO PLANTS

Mikhail K. Manankov, Simferopolsky raion, selo Molodezhnoe, ulitsa Polevaya 6,, Krymskaya oblast, U.S.S.R.

Filed Nov. 5, 1979, Ser. No. 91,582
Claims priority, application U.S.S.R., Feb. 26, 1979, 2723951
Int. Cl.[3] A01G *1/00*; C05C *9/00*
U.S. Cl. 47—58 **23 Claims**

1. A method of introducing a biologically active chemical agent into plants whereby rapid penetration of said chemical agent into said plants occurs and the activity of said chemical agent is substantially enhanced comprising applying to a plant an effective amount of a composition in the form of a powder or an aqueous solution containing said chemical agent in admixture with a penetrating enhancing agent selected from the group consisting of water soluble low molecular weight polyhydric alcohols and water soluble low-molecular weight carbohydrates.

4,291,498

METHOD FOR PRODUCTION OF MATURE ASEXUAL CACAO EMBRYOS, AND PRODUCT THEREOF

Jules Janick; Paul M. Hasegawa, both of West Lafayette, Ind., and Valerie C. Pence, Gainesville, Fla., assignors to Purdue Research Foundation, West Lafayette, Ind.

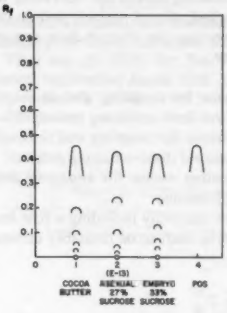
Filed Mar. 20, 1980, Ser. No. 131,883
Int. Cl.[3] A01G *1/00*
U.S. Cl. 47—58 **12 Claims**

1. A non-agricultural method for the production of cacao embryos comprising the steps of:

(A) treatment of immature zygotic cacao embryos in a basal medium in the presence of a growth enhancer to initiate asexual embryos;

(B) proliferating said embryos by low sugar amendment of said basal media after removal of said growth enhancer;

(C) growing said embryos in said media under aerated conditions to optimum size under said low sugar conditions;



(D) continuing the growth of said embryos in said media under aerated conditions and by a high sugar amendment to the said basal media; and

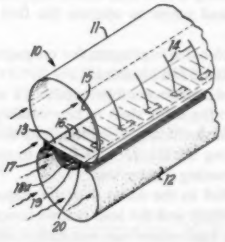
(E) harvesting the embryos so produced.

4,291,499

PROPAGATION OF PLANTS

John R. Prewer, 82 Thomas More House, London, England (EC2Y 8AB)

Filed Aug. 14, 1979, Ser. No. 66,317
Int. Cl.[3] A01G *31/00*; A01C *1/04*
U.S. Cl. 47—59 **21 Claims**



1. A propagator for the cultivation of plants in a controlled environment comprising upper and lower elongate containers having a common perforated wall, a plurality of plant seeds supported in spaced relation by or adjacent the common wall, means for injecting liquid in the form of vapor or droplets into an end of each of the elongate containers and means for maintaining a pressure in the elongate containers greater than atmospheric pressure.

4,291,500

APPARATUS FOR OPENING AND CLOSING AIR LOCK DOORS

George M. Reckin, Delafield; Richard A. Lofy, Elm Grove, and Robert S. Dean, Wauwatosa, all of Wis., assignors to Lakeside Bridge & Steel Co., Milwaukee, Wis.

Filed Aug. 30, 1979, Ser. No. 71,233
Int. Cl.[3] E06B *7/00*
U.S. Cl. 49—68 **20 Claims**

1. A door control system for opening an outer door of an air lock for entry into the lock chamber from the outside and for opening an inner door for leaving the lock chamber to enter a pressurized region, the door control system comprising:

first door-actuating means for operating the outer door between a locked, closed position and an open position;

means for connecting the first door-actuating means to the outer door;

second door-actuating means for operating the inner door between a locked, closed position and an open position;

means for connecting the second door-actuating means to the inner door;

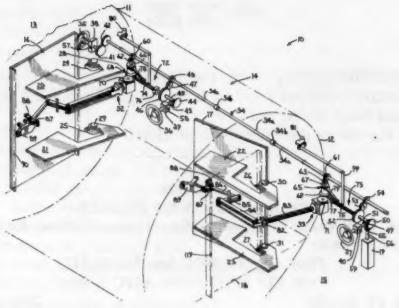
a drive shaft;

first clutch means for coupling and decoupling the drive shaft to the first door-actuating means;

second clutch means for coupling and decoupling the drive shaft to the second door-actuating means;

first clutch-actuating means for engaging and disengaging the first clutch means;

a first lead screw assembly including a first lead screw coupled to the drive shaft to be rotatably driven thereby, and



also including a first lead screw nut that advances along the first lead screw to operate the first clutch-actuating means;

second clutch-actuating means for enagaging and disengaging the second clutch means;

a second lead screw assembly including a second lead screw coupled to the drive shaft to be rotatably driven thereby, and further including a second lead screw nut that advances along the second lead screw to operate the second clutch-actuating means; and

means coupled to the drive shaft for imparting rotation to the drive shaft and the lead screws coupled thereto,

wherein the lead screw nut assemblies alternately operate their associated clutch-actuating means to alternately operate the doors.

4,291,501

DEVICE FOR COUNTERBALANCING A SWIVELABLE BODY PART ON A MOTOR VEHICLE

Klaus Steinberg, Prile, and Gerhard Hoffmann, Neukeferloh, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

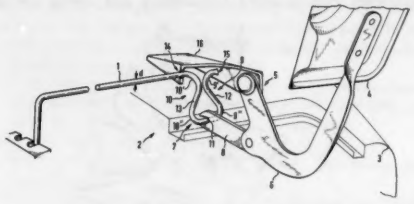
Filed Feb. 23, 1979, Ser. No. 14,586

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2808063

Int. Cl.³ E05F *1/10*

U.S. Cl. 49—386 **5 Claims**

1. A device for counterbalancing a swivelable body part on a motor vehicle, such as a trunk lid on an automobile, comprising hinge means for the swivelable body part and a torsion bar, said torsion bar being bent to form a crank in the vicinity of a movable hinge part of said hinge means, intermediate lever means articulated on the movable hinge part and engaging the crank, said crank including a crank pin between two legs, the legs comprising first arcuate segments connected with the torsion bar and second arcuate segments connected with the



crank pin, and wherein said first and second arcuate segments each extend through an arc of more than 90 degrees.

4,291,502

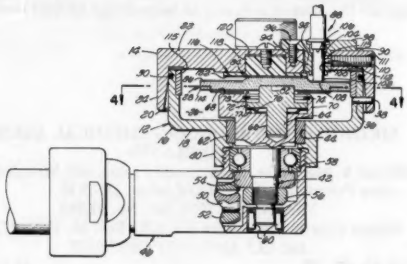
GRINDING OR POLISHING TOOL

Emerson A. Grimsby, Brea, and Stanley W. Levasheff, Huntington Beach, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 24, 1979, Ser. No. 78,520

Int. Cl.³ B24B *7/00*

U.S. Cl. 51—120 **6 Claims**



1. A tool for grinding or polishing a surface of a workpiece such as the mating end of an optical fiber ferrule comprising:

a housing having a chamber therein;

a planar grinding wheel rotatable in said chamber;

means for rotating said wheel, said rotating means causing said wheel to rotate and simultaneously move transversely in the plane in which it lies;

said wheel embodying a grinding and polishing surface, and a raised, flat bearing surface;

said housing embodying a wall facing said bearing surface;

said wall embodying a flat reference surface constantly engageable by said bearing surface during rotation of said wheel in said chamber;

a bore extending through said wall outside of said reference surface and the path of movement of said bearing surface adapted to receive the workpiece and position said surface thereof in engagement with said grinding or polishing surface of said wheel; and

means biasing said bearing surface into engagement with said reference surface.

4,291,503

WORKPIECE TREATING BARREL

Yasunaga Higashi, 171-1 Ozuku-cho, Kashihara, Nara, Japan

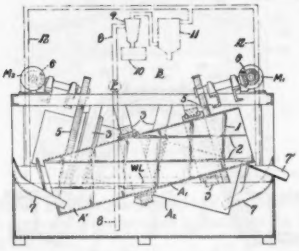
Filed Sep. 5, 1979, Ser. No. 72,700

Int. Cl.³ B24B *31/02*

U.S. Cl. 51—164.1 **7 Claims**

1. A barrel apparatus for use in treating workpieces comprising a pair of rotary barrels of same structure and length rotat-

ably mounted in a frame and disposed in such a manner that the axial lines of both barrels intersect with each other about their respective midpoints in the form of the letter X when viewed from the lateral side and lie parallel to each other when viewed from the top, each of said barrels having a first spiral flight provided on the inner peripheral wall of the barrel and at least one ancillary flight provided on the inner peripheral wall



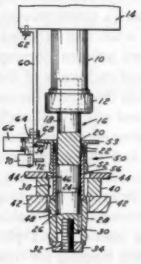
longitudinal of the barrel and intersecting said spiral flight, all of said flights extending from one end of the barrel to the other and each ancillary flight being lower in height than the first spiral flight, both of said barrels having means for simultaneously driving and rotating them fixed to the frame and being provided with chute means connecting the outlet upper end of each barrel with the inlet lower end of each other barrel.

4,291,504

METHOD AND APPARATUS FOR IN-PROCESS GAGING OF TOOL ELEMENTS

Paul Fitzpatrick, Fenton, and Richard J. Gavasso, West Olive, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 3, 1980, Ser. No. 126,922
Int. Cl.³ B24B *49/06, 1/00*
U.S. Cl. 51—165.88 **12 Claims**



1. An apparatus for gaging the cross-sectional diameter of an adjustable abrading tool in an abrading machine to a pre-determined diameter by gaging the diameter of a workpiece bore being machined and controlling the operation thereof comprising

(a) a gage means slideable mounted on said abrading tool shaft means,

(b) means for selectively engaging said gage means at predetermined intervals into a workpiece bore,

(c) means for disengaging said gage means from said bore, and

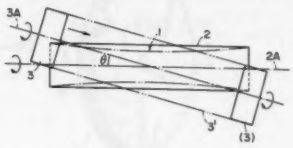
(d) means for selectively stopping said abrading machine when said gage means fails to enter said bore.

4,291,505

PROCESS FOR PRODUCING NEGATIVE-CROWNED ROLLER

Shinnosuke Taniishi, Kawasaki, and Tsukasa Kuge, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1979, Ser. No. 79,081
Claims priority, application Japan, Oct. 2, 1978, 53-121335
Int. Cl.³ B24B *1/00, 5/16*
U.S. Cl. 51—289 R **9 Claims**



1. A process for producing a negative-crowned roller, which comprises:

maintaining a grinding tool in contact with a cylindrical-form material to be ground;

maintaining said material in rotation; and

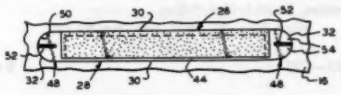
linearly displacing said grinding tool relative to said material to be ground along a direction inclined with respect to the rotary axis of said material to be ground to produce the negative crowned roller surface thereon.

4,291,506

HONE STONE WITH COMPRESSIBLE ENDS

Carl H. Kramm, Pinckney, Mich., assignor to RLK Research, Inc., Howell, Mich.

Filed Feb. 1, 1979, Ser. No. 8,420
Int. Cl.³ B24B *33/02*
U.S. Cl. 51—338 **2 Claims**



1. A hone stone assembly for use with honing heads having stone receiving openings defined by side surfaces and end surfaces and an internal stone assembly support and expander comprising, in combination, a synthetic plastic relatively rigid body having a longitudinal axis, a bottom surface, first and second lateral sides, a top surface and first and second end regions having convex cylindrical segment end surfaces, a cavity defined in said body intersecting said top surface, an abrasive stone mounted within said cavity having a working face disposed adjacent said top surface, and a slot defined in each of said end regions extending in the direction of said body axis intersecting said top and bottom surfaces and the associated end surfaces defining a pair of stiffly resilient cantilevered bifurcated portions in each end region extending in the direction of said body axis whereby said slot permits said bifurcated portions of said end region on opposite sides of said slot to deflect toward each other upon insertion of said body in a honing head opening having a lateral dimension adjacent the opening end surfaces slightly less than the width of the slotted end region to provide a firm frictional engagement between the hone stone assembly and the honing head.

4,291,507
HIGH SPEED GRINDING WHEEL FOR GLASS

John J. Littlehorn, Jr., 4530 South Broadway, Englewood, Colo. 80110

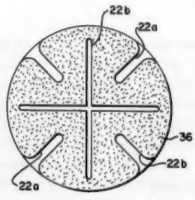
Filed Nov. 28, 1979, Ser. No. 98,185
Int. Cl.[3] B24D 9/02
U.S. Cl. 51—374 1 Claim

1. A high speed grinding wheel having a narrow continuous abrasive belt for grinding glass and like brittle materials, comprising a narrow, flat, disc-shaped body of flexible, resilient material having a hardness factor of between about 30 and about 100 durometer, said body defining parallel, spaced, opposed, circular faces joined at their circumferences by a narrow, cylindrical, peripheral surface, a plurality of relatively short, thin, radial slits equidistantly defined in said body around the circumference thereof and opening into said peripheral surface thereof and into one of said faces, said slits being spaced apart a distance approximately equal to the radial depth thereof and having a depth equal to about one-sixth of the radius of the wheel, the other of said faces being unbroken by said slits, said abrasive belt being snugly supported on and completely surrounding said peripheral cylindrical surface during grinding use thereof.

4,291,508
LENS SURFACING PAD

Louis Prunier, Charlton, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 30, 1979, Ser. No. 99,227
Int. Cl.[3] B24D 10/02
U.S. Cl. 51—395 9 Claims



1. A lens surfacing pad comprising:

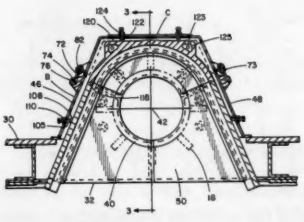
a unitary cutaway main surfacing pad component having multiple interconnected pad sections with channelling therebetween for the distribution of abrasive slurries over the component during use of said pad; and

a permanent thin and flexible supporting film to which said component is affixed for rendering said pad freely conformable to a lens surfacing tool of a surfacing machine without appreciable disruption of relative orientation of said pad sections, said film being continuous across said channels and securable to said surfacing tool.

4,291,509
GUARD HOUSING AND LINER FOR BLADED CENTRIFUGAL BLASTING WHEELS

Harold F. Schulte, Mishawaka; Raymond M. Leliaert, and Robert D. Rohr, both of South Bend, all of Ind., assignors to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Oct. 22, 1979, Ser. No. 87,060
Int. Cl.[3] B24C 9/00
U.S. Cl. 51—432 12 Claims

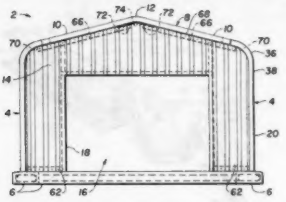


1. A guard housing and lining for a bladed wheel whereby particulate material is thrown by centrifugal force from the ends of the blades onto a surface below the wheel including a base on which the wheel is mounted with an opening through the base in alignment with the blades of the wheel for projection of particulate material therethrough onto the surface to be treated, said wheel being supported for rotational movement on a hub extending axially into engagement with one side of the wheel and means for feeding particulate material from a feed spout communicating with an axial opening at the other side of the wheel, said guard housing and lining comprising a trapezoidal section open at the bottom and at the top with a larger opening at the bottom in which the trapezoidal section is formed of vertically disposed front and back walls and inclined end walls spaced one from the other by an amount greater than the respective width and length of the bladed wheel, means mounting the trapezoidal section of the housing onto the base with the open botton in registry with the opening through the base plate, a cover having laterally spaced apart front and back side walls and inclined end walls spaced one from the other by an amount corresponding to the spaced relation of the side and end walls of the trapezoidal section at their right ends so that the cover fits onto the open top of the trapezoidal section, and a top wall enclosing the upper end of the cover, a pivotal connection between at least one of the end walls of the cover and the corresponding end wall of the trapezoidal section to enable the cover to be rocked between open and closed positions and including means for disengagement of the pivotal connection to enable removal of the cover from the trapezoidal section, and plates of lining material supported by the guard housing for lining the interior surface thereof, in which the lining is formed of sections consisting of a lower side wall lining formed of a pair of lower side wall sections for each side wall and means for securing the lower side wall sections to the adjacent side wall of the trapezoidal section of the guard housing, a pair of end wall sections spanning the space between the ends of the side wall sections and means for blocking movement of the end wall sections from their assembled relation, a top section which spans the space between the upper ends of the end wall sections, and an upper side wall section for each side wall filling the space between the upper edges of the lower side wall sections and the top section, and means operatively engaging the top wall section to hold down the top wall section when the cover is in closed position.

4,291,510
PREFABRICATED BUILDING CONSTRUCTION

Eugene W. Sivachenko, 6471 Riverside Dr., Redding, Calif. 96001

Filed Dec. 15, 1977, Ser. No. 860,797
Int. Cl.³ E04B 7/00
U.S. Cl. 52—90 13 Claims

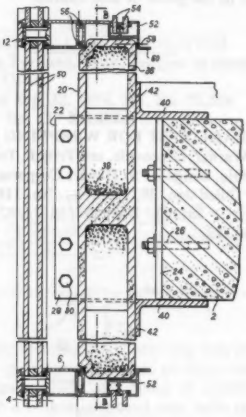


1. A building including a plurality of drainage openings in the curved portions of the member to facilitate the drainage of water from the roof.

4,291,511
STRUCTURAL ASSEMBLIES

Richard L. Stoakes, "Clouds", Northdown Rd., Woldingham, Surrey, England

Filed Jun. 25, 1979, Ser. No. 51,353
Claims priority, application United Kingdom, Jun. 27, 1978, 28049/78
Int. Cl.³ E04B 1/76, 2/42
U.S. Cl. 52—235 10 Claims

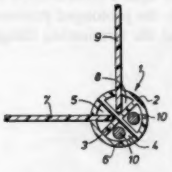


1. A structural assembly comprising a supporting structure and a curtain wall framework, said structure comprising at least one horizontally extending load-bearing member, said curtain wall framework comprising a plurality of upwardly extending, laterally spaced mullion members, tie-back elements fixed to said mullion members and to said at least one load-bearing member to secure the framework to the supporting structure inner faces of said mullion members being located by said tie-back elements in a position outwardly spaced from said at least one load-bearing member, whereby regions of said inner faces are located opposite and adjacent said at least one load-bearing member, a plurality of fire-resistant members interposed in the space between the framework and said at least one member and supported through said at least one member, said fire-resistant members overlying said inner faces of the mullion members and forming a substantially continuous barrier between said framework and said at least one member, said barrier at least partly filling the space between said framework and said at least one member.

4,291,512
JOINTS

Jeffrey Walton, New North Rd., Huddersfield, Yorkshire, England

Filed May 22, 1979, Ser. No. 41,861
Claims priority, application United Kingdom, May 26, 1978, 23134/78
Int. Cl.³ E04B 1/00
U.S. Cl. 52—282 10 Claims

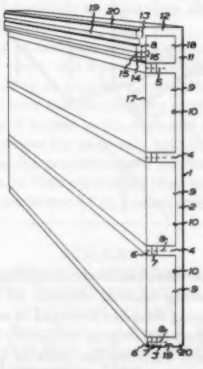


1. A jointing member of hollow cylindrical form having at least one internal compartment extending lengthwise of the member part of the surface of the member forming an outer wall of the internal compartment, said outer wall being slit longitudinally of the member to divide the wall into two lips whose edges are in contact, the lips being of a resilient material and thereby deformable to allow entry into the compartment of the edge of a sheet of material which is then retained in position by said resilient lips.

4,291,513
WALL CONSTRUCTION UNIT FOR BUILDINGS

Sven J. Ankarswed, Vesteras, Sweden, assignor to Ankarswedshus AB Vasteras, Sweden

Filed Jan. 15, 1980, Ser. No. 112,264
Claims priority, application Sweden, Jan. 22, 1979, 7900560
Int. Cl.³ E04B 1/04, 2/00
U.S. Cl. 52—284 4 Claims



1. Wall construction unit for buildings, said unit (1) comprising a reinforced concrete layer (2) constituting the outside of the building, from which layer longitudinal, substantially parallel, first, second and intermediate flanges (3, 5 and 4, respectively) of reinforced concrete, spaced apart at predetermined intervals, extend inwardly at right angles to the concrete layer, joists (6) with intermediate insulation (7) being joined by casting by means of clamp-irons (8) to the free edge of said flanges, insulation material (9) being provided in the space defined by

two adjacent flanges (3, 4, 5) with associated joists (6) and intermediate insulation (7) and by the inner side (10) of the concrete layer (2), wherein the wall construction unit also includes a prolonged portion (11) of the reinforced concrete layer (2) extending from the second flange (5), an intermediate portion (12) which extends from the end of the prolonged portion at right angles thereto and which is parallel with said flanges (3, 4, 5), and a terminating flange (13), with associated joist (14) and intermediate insulation (15), which extends at right angles from the end of the intermediate portion in inward direction, the side (16) of the terminating flange facing the prolonged portion being aligned with the outside (17) of the insulation material (9), and insulation (18) being provided in the space of substantially square cross-section which is defined by the second flange (5), the prolonged portion (11), the intermediate portion (12) and the terminating flange (13).

4,291,514

HIGH TEMPERATURE ENCLOSURES

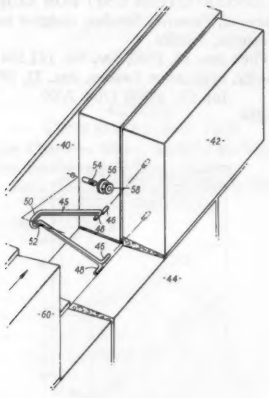
Barrie J. Harvey, Tyldsley, England, assignor to M. H. Detrick Co., Limited, London, England

Division of Ser. No. 826,863, Aug. 22, 1977, Pat. No. 4,151,693. This application Mar. 30, 1979, Ser. No. 25,747

Claims priority, application United Kingdom, Mar. 7, 1975, 9680/75

Int. Cl.³ E04B *1/38*

U.S. Cl. 52—509 **10 Claims**



1. A high temperature enclosure comprising a metal supporting structure having secured thereon an internal lining of refractory/insulating modules arranged in side to side relation with a resilient packing strip of refractory material arranged under compression between the sides of adjoining modules wherein each module comprises a rectangular block which is moulded in one piece from ceramic fibre by a vacuum forming operation and has a resilient packing strip secured along two adjacent sides thereof and wherein the said blocks are secured in position on said structure by fastening members each having a body portion disposed between the sides of adjoining blocks, laterally and oppositely directed sharp projections which are pressed into and pierce the said sides, and a laterally directed foot which is secured to the said structure.

4,291,515

STRUCTURAL ELEMENTS

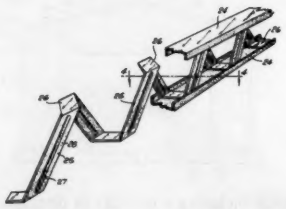
Claude G. Harding, Newcastle, Australia, assignor to John Lysaght International Holdings S.A., Panama

Filed Oct. 24, 1979, Ser. No. 87,898

Claims priority, application Australia, Nov. 7, 1978, PD6674

Int. Cl.³ E04C *2/42*

U.S. Cl. 52—694 **18 Claims**



1. A structural element comprising two coplanar chords having mutually facing flat surfaces and a web in the form of a zigzag strip having inclined straights alternating with flat crests by which the web is secured to said flat surfaces and between both of the chords, characterised in that:

(a) each of said crests is parallelogrammatic and the larger angle of the two supplementary angles at the respective ends of any one side of the crest is between 120° and 150°; and,

(b) the major cross-sectional dimension of each of said straights extends in a plane having at least a component parallel to the plane of said chords.

4,291,516

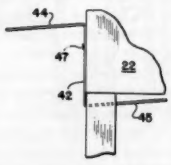
PACKAGE REST FOR WRAPPING STATION

Norbert C. Warner, Greenville, and Fritz F. Treiber, Centerville, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Jan. 28, 1980, Ser. No. 116,180

Int. Cl.³ B65B *67/10, 11/02*

U.S. Cl. 53—219 **7 Claims**



1. For use with a wrapping device including a stand for supporting a roll of wrapping material and means guiding the material from the roll to a wrapping station,

a package rest member comprising a central section,

first and second shelves extending from said central section in generally transverse relation to said central section and in spaced relation to one another,

one of said shelves being substantially greater in area than the other shelf,

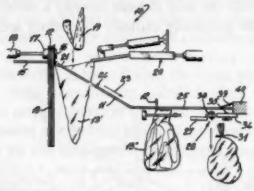
and reversible mounting means on said rest member permitting selective mounting thereof to the stand with either one of said shelves in operative position at the wrapping station and the other shelf located below the wrapping station.

4,291,517

METHOD AND APPARATUS FOR BAG FILLING, TIEING AND TRANSFER

Arnold Lipes, 6521 Merton Rd., Coté St. Luc, Quebec, Canada

Filed Dec. 14, 1979, Ser. No. 103,737
Int. Cl.³ B65B *43/46, 51/08*
U.S. Cl. 53—468 **10 Claims**



1. A method of filling and transferring an open mouth bag, said bag having an extended tab above a mouth opening, holes in said tab for supporting said bag on holding pins, said method comprising:

(i) holding said tab of a first bag to be opened from a plurality of juxtaposed bags,

(ii) opening said mouth opening at a filling location,

(iii) filling said bag with a product,

(iv) releasing said tab to cause displacement of said first bag to a further location remote of said filling location while supporting said bag by said tab held by holding pins,

(v) sealing said bag below said mouth opening to close said opening, and

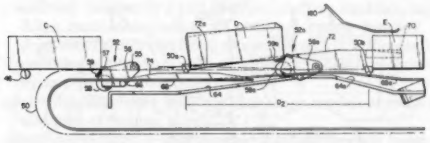
(vi) detaching said tab from said holding pins.

4,291,518

PACKING CASE TAB SLITTER

Lloyd D. Johnson, Portland, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed Sep. 12, 1979, Ser. No. 75,324
Int. Cl.³ B65B *61/06, 7/20*
U.S. Cl. 53—491 **21 Claims**



1. Apparatus for severing the connecting tabs at diagonally opposite corners of an upwardly open packing case, said case having a rectangular shape and being of flexible carboard construction with a bottom, opposed side walls connected to front and rear end walls, and having side, front and rear top flaps folded downwardly alongside these side, front and rear walls respectively and held in place by said tabs, said apparatus comprising:

(a) case conveying means for moving the case in a horizontal downstream direction so that one connecting tab is at the forward end of the case and the opposite tab is at the trailing end of the case,

(b) case canting means including means movable with the case conveying means, and engageable with the forward end of the case to raise at least that forward corner of the case which has said forward connecting tab,

(c) case guiding means for engaging the opposite side walls of the case at least when it is being so canted on the conveying means,

(d) a fixed knife associated with said case guiding means at one side of the conveying means for severing said trailing connecting tab,

(e) said case canting means also operable to lower the forward end of said raised case, and

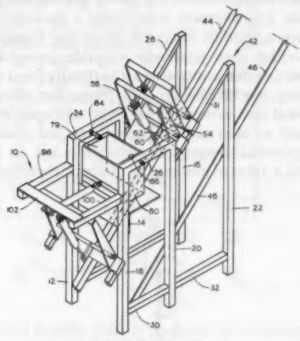
(f) a fixed knife associated with the case guiding means at the opposite side of the conveying means to sever the leading connecting tab of the case as the case is lowered.

4,291,519

BOTTLE CARTON FILLING MACHINE

Daniel Johnson, 9877 Myron St., Pico Rivera, Calif. 90660

Filed May 30, 1980, Ser. No. 154,941
Int. Cl.³ B65B *35/36, 5/06, 5/08, 5/10*
U.S. Cl. 53—534 **5 Claims**



1. Apparatus for filling cases with bottles including:

a case filling station;

a first conveyor means for sequentially providing empty cases to the apparatus;

a second conveyor means for sequentially removing filled cases from the apparatus, said first conveyor means being disposed on an elevation to said apparatus higher than said second conveyor means;

a third conveyor means for sequentially providing bottles to be placed in the cases to the apparatus at said case filling station;

means disposed in said apparatus for positioning said case at predetermined positions on said ramp at said case filling station; and,

means positioned at said case filling station for placing said bottles in said cases, said means for placing said bottles in said case including an angularly rotatable U-shaped member positioned over said platform for receiving a predetermined number of bottles in the open end of said U-shaped member and means for angularly rotating said U-shaped member when the predetermined number of bottles are placed therein to slide the bottles from said platform into an awaiting case at one of its predetermined positions.

4,291,520

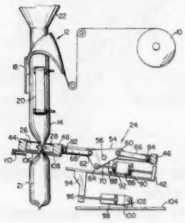
VERTICAL FORM, FILL AND SEAL PACKAGING MACHINE WITH IMPROVED END SEALING AND STRIPPING MEANS

Clarence F. Prince, Springfield, and Roger L. Putnam, Jr., East Longmeadow, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Dec. 26, 1979, Ser. No. 107,136
Int. Cl.³ B65B *9/10, 51/30*
U.S. Cl. 53—551 **10 Claims**

1. In a vertical form, fill and seal packaging machine comprising a source of flexible packaging material in the form of an elongated thin flat strip of material of uniform width and comprising successive flat package blanks as integral longitudinally contiguous sections thereof, a tube former adapted to receive said strip material and progressively form the same in passage

therethrough to a depending and upwardly open tubular configuration, opposite longitudinal edge portions of the material being progressively juxtaposed in passage through said former so as to extend vertically and in parallel relationship, product dispensing means above said tube former for the gravity discharge of measured quantities of product through the former and into the interior of said depending tube of packaging material through its said upwardly open end, side sealing means disposed beneath said tube former for sealing said juxtaposed vertically extending longitudinal edge portions of the tube, vacuum belt tube feed means beneath the tube former operable intermittently to draw the packaging material through the former and thus successively to present integral tubular package blanks therebeneath for filling, sealing and package formation; the improvement comprising a package end sealer and stripping apparatus having a mounting frame and front and rear sealing jaws relatively movable generally horizontally between an open position and a vertically fixed closed position, operating mechanism on said frame for effecting generally horizontal jaw movement between said open and closed positions and an intermediate partially closed position where the jaws oppositely engage and compress but do not fully close and seal a tube of packaging material therebetween, stripper



means mounted on and movable with said jaws to oppositely engage and substantially fully close the tube of packaging material when the jaws are in their intermediate position, and means associated with said frame for moving the same together with said operating mechanism, sealing jaws, and stripper means with the latter in said intermediate position, said means serving to effect a generally vertically downward movement of said jaws and stripper means relative to said tube of packaging material whereby to clear the tube internally and to flatten the same for efficient end sealing by said front and rear jaws in subsequent fully closed and vertically fixed position of the jaws and with the feed means inoperative, said mounting frame for said sealing jaws and operating mechanism being supported for pivotal movement causing said front and rear jaws to traverse a shallow arc lying generally in a vertical plane approximately at the center of said depending tube of packaging material, and said means for moving the mounting frame being operable in one and an opposite direction to pivot the frame causing the sealing jaws to move generally vertically along said shallow arc between upper and lower positions, said lower position being the sealing position of the jaws and said upper position representing the start position for the stripping action of the stripper means on the jaws at the intermediate jaw position.

4,291,521

HUSK SEPARATOR FOR CORN HARVESTER

Hinrich Haake, Ahrensburg, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG-Zweigniederlassung FAHR, Gottmadingen, Fed. Rep. of Germany

Filed Oct. 27, 1978, Ser. No. 955,181

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1977, 2748950

Int. Cl.³ A01D *14/02*

U.S. Cl. 56—13.5 **10 Claims**

1. An apparatus for harvesting corn comprising:

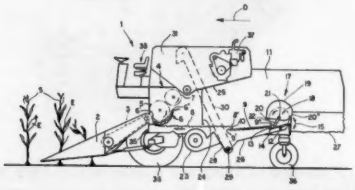
a chassis adapted to travel along the ground;

means on the front of said chassis for picking ears off cornstalks;

means on said chassis for reducing said ears to fragments including pieces of corn cob, corn kernels, and pieces of corn husks and for displacing said fragments backwardly;

a first comb on said chassis having generally horizontal first tines positioned to support said fragments;

a second comb on said chassis having a central shaft and a plurality of generally radially extending second tines dis-



placeable on rotation of said shaft between and past said first tines;

means on said chassis for rotating said second comb and thereby orbiting said second tines between and past said first tines to separate the husk pieces from the cob pieces and kernels and displace the separated husk pieces away from said first comb; and

means on said chassis for stripping husk pieces off said second comb.

4,291,522

MOWER MOUNTED ON VEHICLE

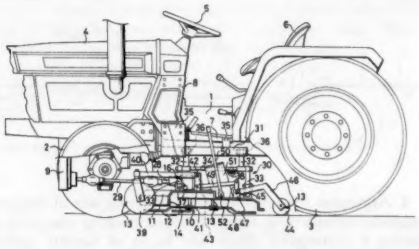
Masami Kawasaki, and Hirofumi Sadakane, both of Sakai, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Mar. 26, 1980, Ser. No. 134,322

Claims priority, application Japan, Apr. 10, 1979, 54-47997[U]; Aug. 20, 1979, 54-115125[U]

Int. Cl.³ A01D *35/12*

U.S. Cl. 56—15.8 **7 Claims**



1. A mower mounted on a vehicle and including a mower frame attached to the bottom of the body of the vehicle, cutting blades rotatably supported by the mower frame and a drive assembly for rotating the cutting blades, pivotal arms supported on the mower frame and pivotally movable upward or downward, gauge members supported by the free ends of the pivotal arms, a single operating member operatively connected to the pivotal arms for pivotally moving the arms, and locking means for engageably or disengageably holding the operating member; the said pivotal arms comprise front and rear pivotal arms, and the front pivotal arms in a pair are pivoted to the opposed ends of the mower frame respectively, the gauge members being supported by the front ends of the front pivotal arms and the rear ends of the rear pivotal arms respectively, the operating member being operatively connected to the pivotal arms at the other ends thereof and the pivotal arms being upwardly or downwardly movable by the

single operating member; the cutting blades being upwardly or downwardly movable to an adjusted position by the pivotal arms moved by the operating member with the gauge members in engagement with the ground, the cutting blades being retainable in the adjusted position by the locking means; at least one of the gauge members being supported by the rear pivotal arm and each of the gauge members supported by the front pivotal arms being supported by the corresponding pivotal arm with a vertical rod and being idly turnable about the vertical rod, and the mower further comprises auxiliary links extending in parallel to the front pivotal arms further connecting the gauge members to the mower frame, the front pivotal arms and the auxiliary links constituting parallel links to permit the vertical rod to retain its axis in the same vertical position when the cutting blades are moved upward or downward with the mower frame by the movement of the operating member.

4,291,523

ROW CROP APPARATUS

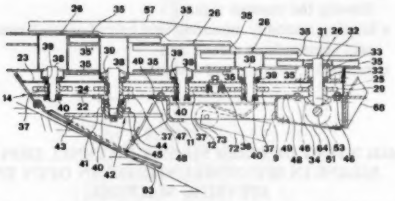
Antoon S. P. Cools, St. Kruis-Brugge, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed May 2, 1980, Ser. No. 146,940

Claims priority, application United Kingdom, May 4, 1979, 15557/79

Int. Cl.³ A01D *45/00, 69/12*

U.S. Cl. 56—94 **2 Claims**



1. A row crop apparatus for a harvesting machine comprising:

a frame including a pair of spaced apart beams;

a stalkway defined by a pair of adjacent drive modules, each drive module including an enclosed casing housing, a drive mechanism and being of a construction sufficient for retaining a lubricant, each drive module being supported by said pair of spaced apart beams;

means for detachably securing each drive module to each of said pair of beams;

means cooperatively locating each module on each beam;

a plurality of intermeshed crop conveyors rotatably connected to said drive mechanism of each module, the conveyors of one module extending into the stalkway in rotatable intermeshed relationship with the conveyors of the adjacent module; and

means connected to one of said beams for rotatably driving the conveyors.

4,291,524

METHOD OF DEFOLIATING

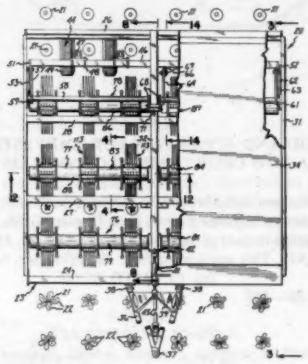
Donald C. Gates, Fargo, N. Dak., assignor to Alloway Manufacturing Inc., Fargo, N. Dak.

Division of Ser. No. 52,756, Jun. 28, 1979. This application Jun. 16, 1980, Ser. No. 159,622

Int. Cl.³ A01D *23/02*

U.S. Cl. 56—121.43 **3 Claims**

1. A method of removing foliage from a root crop, as sugar beets, with a machine having a cover means for preventing foliage from passing therethrough and first, second, and third flexible flails disposed for rotation about separate axes extending transverse to the direction of movement of the machine and being located along a line extended in the direction of movement of the machine said method comprising: rotating a plurality of first flexible flails in a first direction at approximately 400 revolutions per minute such that the lower-most portion thereof of the first and second flexible flails moves in the direction of movement of the machine to remove part of the foliage from a root crop, rotating a plurality of second flexible flails also in said first direction at approximately 400 revolutions per minute such that the lower-most portion thereof of the second flexible flails moves in the direction of movement of the machine to remove additional foliage from the root crop, rotating



a plurality of third flexible flails in a second direction opposite the first direction of movement of the first and second flexible flails at approximately 400 revolutions per minute to remove further foliage from the root crop; and

sequencing the passage of said first, second and third flexible flails such that said first and second flexible flails are disposed forwardly of said third flexible flails during said method whereby the first and second flexible flails pass over the crop before the third flexible flails.

4,291,525

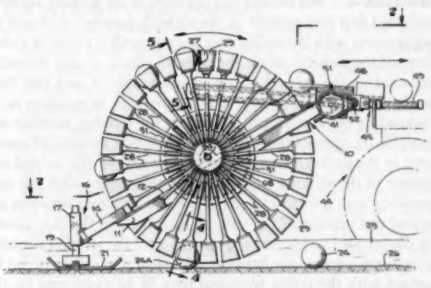
ROTARY CROP HARVESTER WITH RAPIDLY REPLACEABLE PARTS

Donald E. Benkert, 1234 Blair Ave., South Pasadena, Calif. 91030

Filed Jul. 21, 1980, Ser. No. 170,937

Int. Cl.³ A01D *45/00*

U.S. Cl. 56—327 R **12 Claims**



1. In a rotary armed harvester for grasping produce having a mobile frame carrying a powered rotary wheel with a plurality of radially arrayed pairs of opposed pick-up arms each with an actuating roller adapted to contact one of a pair of mirror imaged cams, each arm being biased toward its opposing arm and alternatively forced away from its opposing arm by displacement of its attached actuating roller by one of said cams, the combination comprising means securing each of said cams

to said frame, pivot brackets and chordal pivots on the powered wheel for the pick-up arms, means securing each bracket to the wheel, a spring on each arm adapted to bias a pick-up arm toward the opposing arm of a pair, said spring being spaced radially from the chordal pivot in the pivot bracket, removable securing means for each of said springs, and removable securing means for each of said actuating rollers operable when said rollers are out of contact with said cam.

4,291,526

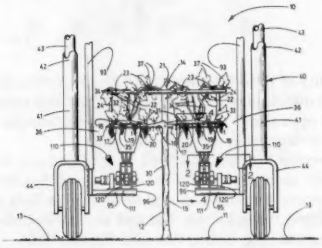
METHOD AND APPARATUS FOR HARVESTING FRUIT FROM A ROW CROP TRAINED ON TRELLIS WIRES OR THE LIKE

Kazuo Hiyama, and Howard K. Hiyama, both of Fowler, Calif., assignors to Hiyama Farms, Inc., Fowler, Calif.

Continuation-in-part of Ser. No. 844,147, Oct. 21, 1977, Pat. No. 4,255,922. This application Sep. 28, 1979, Ser. No. 80,007

Int. Cl.³ A01D *46/00*

U.S. Cl. 56—330 **5 Claims**



1. An apparatus for harvesting crops from plants grown in a row and supported on a trellis wire or the like, the apparatus comprising a vehicle adapted for earth traversing movement along such a row of plants; a striking member having opposite first and second end portions; means mounting the striking member on the vehicle for reciprocal movement in opposite striking and return directions substantially about an axis between said first and second end portions of the striking member with said first end portion of the striking member disposed for engagement with the trellis wire during earth traversing movement of the vehicle along the row of plants; a cam assembly mounted on the vehicle on the opposite side of said axis from the first end portion of the striking member in position to be engaged by the second end portion of the striking member and operable by contact therewith to impart said reciprocal movement to the striking member; means for urging the second end portion of the striking member into engagement with the cam assembly with a force such as to maintain contact between the second end portion of the striking member and the cam assembly during said reciprocal movement until the striking member encounters a resistance force greater than that encountered by contact with the trellis wire and then to be overcome by the striking member encountering the resistance force to draw the second end portion of the striking member from the cam assembly; and means for operating the cam assembly to impart said reciprocal movement to the striking member whereby a repeated striking force is applied to the trellis wire by the striking member during movement of the vehicle along the row to dislodge the crops from the plants while minimizing damage resulting from contact of the striking member with objects affording greater resistance than the trellis wire.

4,291,527

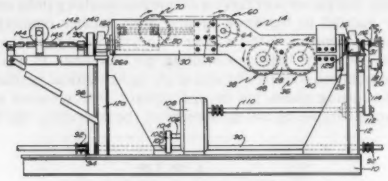
CABLE STRAND TENSION CONTROLLING APPARATUS

Joseph R. Allard, Warwick, R.I., assignor to The Entwistle Company, Hudson, Mass.

Filed Aug. 15, 1980, Ser. No. 178,289

Int. Cl.³ D07B *3/00*

U.S. Cl. 57—58.84 **8 Claims**



1. A cable strand apparatus in a wire strand cabling system, comprising in combination:

a pair of axially spaced capstan means about both of which the entering strand is trained;

an accumulator means about which the cable is trained after leaving the capstan means;

a housing rotatably mounting said pair of capstan means and said accumulator means; and

a means for rotating said housing.

4,291,528

MOUNTING OF FIBER SUPPLY CHANNEL DEFINING MEANS IN SPINNING UNITS OF AN OPEN END SPINNING MACHINE

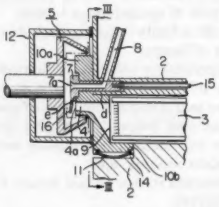
Noriaki Miyamoto; Masao Shiraki, both of Kariya, and Kinpei Mitsuya, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 20, 1979, Ser. No. 96,170

Claims priority, application Japan, Nov. 24, 1978, 53-162231[U]

Int. Cl.³ D01H *7/892*

U.S. Cl. 57—58.95 **7 Claims**



1. A spinning unit in an open end spinning machine, said unit comprising:

a carding roller housing;

a carding roller positioned within said housing for opening a sliver into individual fibers;

a spinning rotor for receiving said individual fibers and for spinning them into yarn;

said housing having therein a fiber supply channel having first and second mouths opening toward said carding roller and said spinning rotor, respectively, for enabling said individual fibers to be transported from said carding roller to said spinning rotor;

said housing including a first portion having at least a part defining a fiber separating edge at said first mouth;

said housing including a second portion substantially enclosing said carding roller;

said first and second housing portions being separable from each other;

coupling means for separably connecting said first housing portion to said second housing portion, said coupling means comprising a surface portion of said second housing portion engageable with said first housing portion, and biasing means disposed between and acting on said first and second housing portions for biasing said first housing portion against said surface portion of said second housing portion, thereby detachably and resiliently mounting said first housing portion on said second housing portion.

4,291,529

FALSE TWIST MACHINE

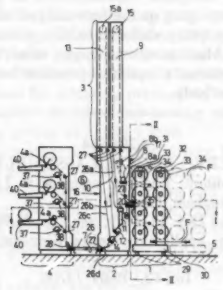
Hans Schellenberg, Winterthur; Eduard Schenkel; Andreas Schwander, both of Seuzach, and Dieter Thalmann, Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Division of Ser. No. 935,110, Aug. 21, 1978, Pat. No. 4,201,036. This application Jan. 4, 1980, Ser. No. 109,663

Claims priority, application Switzerland, Mar. 1, 1978, 2195/78

Int. Cl.³ D02G *1/02*; D01H *13/28*

U.S. Cl. 57—291 **3 Claims**



1. In a false twist machine for threads, a texturizing station having an operating side comprising

a first supply device for taking in a thread;

a first heat treatment zone located above said supply device to receive a thread therefrom;

a cooling zone below said heat treatment zone for the thread;

a false twist device below said cooling zone for imparting a false twist to the thread;

a second supply device for taking up the thread below said false twist device;

a second heat treatment zone adjacent said first heat treatment zone to receive the thread from said second supply device; and

a third supply device below said second supply device for taking up the thread from said second heat treatment zone wherein said first supply device, said false twist device, said second and said third supply devices are mutually offset from the top down and toward said operating side.

4,291,530

GAS TURBINE ENGINE COWLING

John R. Ballard, Chesham, England, assignor to Rolls-Royce Limited, London, England

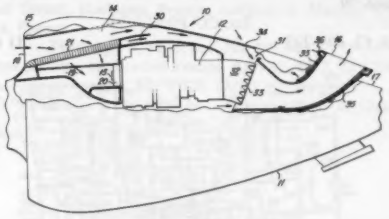
Filed Jan. 29, 1980, Ser. No. 116,653

Claims priority, application United Kingdom, Mar. 16, 1979, 09332/79

Int. Cl.³ F02C *7/052*

U.S. Cl. 60—39.09 P **8 Claims**

1. A gas turbine engine cowling suitable for a helicopter comprising a casing, a gas turbine engine enclosed within said casing, primary duct means adapted for the passage of air through said cowling, secondary duct means interconnecting said primary duct means and the air intake of said engine, a vortex tube separator panel interposed between said primary duct means and the intake of said engine and located at the



junction of said primary and secondary duct means so as to constitute a portion of the wall of said primary duct means, and air flow inducing means powered in operation by said engine and adapted to induce an airflow through said primary duct means.

4,291,531

GAS TURBINE ENGINE

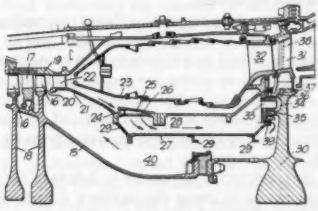
David A. Campbell, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Mar. 27, 1979, Ser. No. 24,361

Claims priority, application United Kingdom, Apr. 6, 1978, 13422

Int. Cl.³ F02C *3/06*, *7/18*

U.S. Cl. 60—39.51 R **9 Claims**



1. A gas turbine engine comprising:

a compressor, combustion system, and turbine in flow series, adjacent static structure defining a compressor discharge duct positioned directly between a downstream extremity of said compressor and an upstream extremity of said combustion system, said compressor discharge duct having at least a portion thereof spaced from said compressor to define a gap therebetween, a shaft drivingly interconnecting said compressor and said turbine, said combustion system having an initial diffusing section serving to diffuse air compressed by said compressor, duct means having an inlet arranged at a location at least part way along said diffusing section and an outlet to said turbine, said duct means conveying cooling air from the main flow of the engine and discharging a first part of said cooling air through said outlet to said turbine without cooling intervening structure of a combustion chamber, and at least one aperture from said duct means to discharge a second part of said cooling air around the outside of said shaft for forward flow along said shaft to cool the same and then be discharged through said gap directly into the compressor discharge duct and the main flow of air therein from said compressor for recirculation by the compressor air.

4,291,532
FUEL SUPPLY SYSTEM

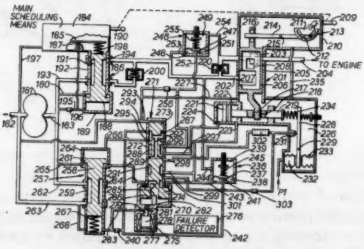
Keith Robinson, Churchdown, England, assignor to Dowty Fuel Systems Limited, Cheltenham, England

Filed Jun. 5, 1979, Ser. No. 45,851

Claims priority, application United Kingdom, Mar. 23, 1979, 10666/79

Int. Cl.³ F02C *9/08*

U.S. Cl. 60—223 **11 Claims**



1. In a liquid fuel supply system including:
(a) a source of fuel under pressure,
(b) a fuel outlet,
(c) flow adjusting means for adjusting fuel flow from the source to the outlet,
(d) a main fuel flow scheduling means normally controlling said flow adjusting means,
(e) an auxiliary fuel flow scheduling means, comprising:
(i) a metering valve having overlapping metering ports through which fuel flows to the outlet, the area of overlap being adjustable by a length movement and a width movement,
(ii) pressure drop responsive means responding to pressure drop at the metering valve to adjust said area of overlap by one of said movements to tend to maintain a constant pressure drop across the metering valve,
(f) a power demand adjuster connected to adjust the main scheduling means and also connected to adjust the said area of overlap of the metering valve ports by the other of said movements,
(g) a failure detector responsive to failure of the main scheduling means to cause the auxiliary scheduling means to begin to control the flow adjusting means by connecting the pressure drop responsive means in substitution for the main flow scheduling means to adjust the flow adjusting means in the sense to maintain a constant pressure drop at the said metering valve ports;
the improvement in which said overlapping ports are disposed in the path of fuel flow from said source of fuel to said outlet both when said main scheduling means controls said flow adjusting means and when said auxiliary scheduling means controls said flow adjusting means.

4,291,533
SUPERSONIC RAMJET MISSILE

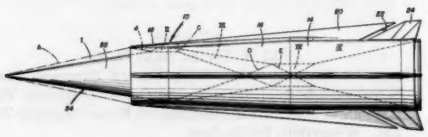
Gordon L. Dugger, and Frederick S. Billig, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 30, 1965, Ser. No. 517,801

Int. Cl.³ F02K *3/00*

U.S. Cl. 60—240 **10 Claims**

1. In a supersonic combustion ramjet missile,
a body,
an innerbody having a portion within the body and a portion projecting forwardly therefrom,
said innerbody being spaced from said body to define an inlet for compressing an air flow from a hypersonic flight Mach number to a supersonic flight Mach number,
said body having therein a combustion chamber, an exhaust nozzle and a fuel tank,
nozzles in the wall of the combustion chamber for discharging fuel from the tank into said chamber,
means in the body and providing fuel flow rate adjustment as a function of Mach number and altitude to control the fuel-air equivalents ratio to effect desired missile operation,
said means including sensors communicating with the combustion chamber, a distribution valve, a fuel pump and a turbine meter connected between the tank and the valve,



a turbine driving the fuel pump, a sensor control unit connected to the valve, one of said sensors being connected to said unit and another to said valve, a computer for controlling said turbine, said turbine meter and said sensor control unit, and means for supplying control signals to the computer representative of pitot and static pressures impinging on the forward end of the innerbody,
said innerbody being shiftable axially within said body in response to Mach number changes, whereby shock waves will be maintained at optimum positions between the body and the innerbody.

4,291,534
SERVO BOOSTER ASSEMBLY

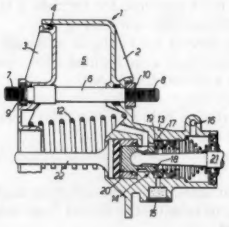
David Jones, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 18, 1979, Ser. No. 85,985

Claims priority, application United Kingdom, Nov. 2, 1978, 42909/78

Int. Cl.³ B60T *13/00*

U.S. Cl. 60—547 R **4 Claims**



1. A brake servo-booster assembly for attachment to a mounting means of a vehicle, comprising a housing having first and second housing parts having inner surfaces defining a chamber there between, control valve means for communicating the chamber alternately with vacuum and ambient air, an input member operatively connected to said first housing part, and movable to operate said control valve means, said first housing part being movable relative to the said second housing part between an inoperative position and an operative, brake-applying position in response to operation of said control valve means and being connected to an output member, said first housing part having an outer surface on the side thereof remote from said chamber which is at all times exposed to ambient air, and wherein said second housing part has connecting means for rigidly attaching said second part to said mounting means, said connecting means including tie means comprising at least one force-transmitting tie bar which extends between said

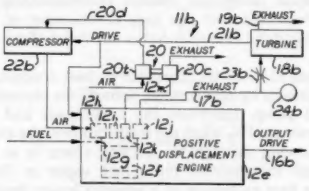
housing parts, said first housing part being slidably and sealingly mounted on said at least one tie bar, one end of said at least one tie bar having means for connection to a master cylinder housing, the other end of said at least one tie bar having means for connection to said mounting means.

4,291,535

METHOD AND APPARATUS AVOIDING BLOWDOWN LOSSES IN COMPOUND ENGINES

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 11, 1978, Ser. No. 941,485
Int. Cl.³ F02B 37/00
U.S. Cl. 60—602 **9 Claims**



1. A compound engine comprising:

a first engine stage of the positive displacement internal combustion form having an air intake and at least one combustion chamber in which fuel is burned and having exhaust means for releasing pressurized exhaust gas from said combustion chamber and having output means for transmitting power to a rotary load,

a second engine stage of the form driven by expansion of pressurized gas received at a gas inlet,

exhaust gas conduit means connecting said first and second engine stages and forming an exhaust gas flow passage for transmitting said exhaust gas from said exhaust means of said first engine stage through said inlet of said second engine stage to operate said second engine stage by expansion of said exhaust gas therein,

drive-transmitting means coupled to said second engine stage for obtaining supplemental output power from said second engine stage, and

flow-regulating means for maintaining the pressure in said exhaust gas flow passage at a level substantially similar to the pressure which exists in said combustion chamber of said first engine stage at the time that said exhaust means thereof opens, wherein said flow-regulating means is adjustable to provide for variation of the size of said exhaust gas flow passage.

9. A method for increasing the output power produced by a compound engine which includes an internal combustion engine of the positive displacement form in which pressurized exhaust gases are released from at least one combustion chamber, wherein said internal combustion engine has at least a pair of exhaust means for releasing said exhaust gases from said combustion chamber, comprising the steps:

utilizing said pressurized exhaust gases to produce additional power by transmitting said gases to a gas expansion engine, including transmitting said pressurized exhaust gases from said combustion chamber to said gas expansion engine through a first of said exhaust means while maintaining the second of said exhaust means closed, preventing expansion of said exhaust gases between said combustion chambers and said gas-expansion engine,

subsequently closing said first exhaust means and opening said second exhaust means to release remaining exhaust gases from said combustion chamber, and

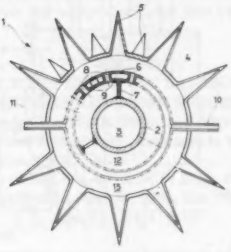
recovering energy from the exhaust gas released through said second exhaust means and utilizing said recovered energy to precompress the air supplied to the intake manifold of said positive displacement engine.

4,291,536

APPARATUS ENABLING THE STORAGE OF RADIOACTIVE WASTES AND THE RECOVERY OF THE EXTRANEOUS HEAT EMITTED THEREBY, AND A STORAGE ELEMENT FOR INCORPORATION IN SUCH APPARATUS

Edmond Girard, Boulogne, France, assignor to Messier S.A., Paris, France

Filed Apr. 3, 1978, Ser. No. 892,682
Claims priority, application France, Apr. 22, 1977, 77 12146
Int. Cl.³ F01K 15/00
U.S. Cl. 60—644 **11 Claims**



1. A storage element for use in the recovery of heat originating from the cooling of radioactive wastes including a first element for the storage of radioactive waste, comprising a first closed shell of spherical shape including the wastes and disposed within a second closed shell of generally spherical shape and bristling with externally projecting radial points or spines, the volume betwen the two shells being filed with a non-contaminatable fluid, promoting the transfer of heat originating from the cooling of the wastes from the first towards the second shell, of which the points or spines serve as radiators in relation to the external medium, and a second element for the recovery of heat originating from cooling of the wastes in said first element further comprising a third spherical shell enclosing said first shell and enclosed by said second shell penetrated by radial passages and within the thickness of which is provided an array of channels isolated from said radial passages and capable of being placed in communication via two conduits integral with said third shell and passing through said second shell with a circuit of a cold generating fluid circuit in such a manner that the circulation within said third shell of the cold generating fluid permits a recovery and an evacuation of heat to the exterior of the storage element with a view to utilisation thereof, the possible excess of heat emitted by the wastes being dissipated towards the external medium by said second shell and its points or spines.

4,291,537

THERMAL ENERGY STORAGE FOR COVERING PEAK LOADS

George Oplatka, Zürich, Switzerland, assignor to BBC Brown, Boveri & Co., Ltd., Baden, Switzerland

Filed May 3, 1979, Ser. No. 35,598
Claims priority, application Switzerland, May 9, 1978, 5041/78; Feb. 1, 1979, 963/79
Int. Cl.³ F01K 3/00
U.S. Cl. 60—652 **6 Claims**

1. A method of evening load fluctuations in an electrical supply network, comprising the steps of:

connecting a thermal store to a main circuit of a thermal power station;

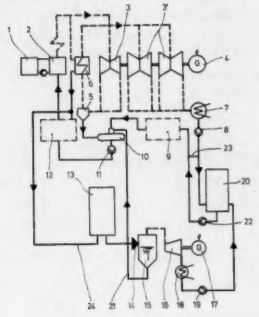
supplying condensate from a reheater of the main circuit to the thermal store;

throttling the working medium of the thermal store to vaporize a portion of the working medium;

supplying the vaporized portion of the working medium from the thermal store to a turbine;

returning a portion of the throttled working medium in liquid form directly to a feedwater tank of the main circuit;

expanding the vaporized portion of the working medium and the steam of the main circuit;



precipitating the expanded steam in a condensor and supplying it to a condensate vessel; and

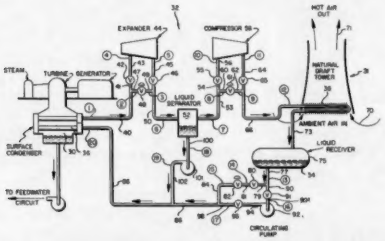
interrupting a flow of working medium from the condensate vessel to a low-pressure feed-heater during the supply of the vaporized portion of the working medium from the thermal store to the turbine.

4,291,538

POWER PRODUCING DRY COOLING APPARATUS AND METHOD

Matloob Husain, Wheaton; Ban-Yen Lai, Willowbrook, and James B. Maher, Oak Brook, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 4, 1980, Ser. No. 109,562
Int. Cl.³ F01K *9/00, 23/04*
U.S. Cl. 60—661 **27 Claims**



1. Apparatus for removal of heat from exhaust or spent steam from a steam driven electric generating power plant in which the steam must be condensed in a hot-well before the water can be reconverted to steam, comprising:

(a) a closed loop containing a refrigerant fluid,

(b) a condenser having a refrigerant inlet and outlet in the closed loop and positioned to effect spent steam condensation in the hot-well by indirect heat exchange with refrigerant fluid flowing through the condenser,

(c) a heat exchanger having a refrigerant inlet and outlet in the closed loop and adapted to be located in a cooling tower to effect indirect heat exchange between refrigerant fluid flowing through the heat exchanger and atmospheric temperature air flowing through the cooling tower to cool the refrigerant fluid,

(d) an expander positioned in the loop between the outlet of the steam condenser and the inlet of a compressor,

(e) a compressor positioned in the loop between the expander outlet and the heat exchanger inlet,

(f) a separator in the loop at the outlet of the expander separating refrigerant liquid from refrigerant vapor,

(g) an expander by-pass conduit communicating with the loop on the upstream and downstream sides of the expander,

(h) a compressor by-pass conduit communicating with the loop on the upstream and downstream sides of the compressor,

(i) a liquid pump and an expansion valve positioned parallel to one another in the loop between the outlet of the heat exchanger and the inlet of the condenser,

(j) a liquid refrigerant conduit communicating with the separator and with the loop downstream of the liquid pump and the expansion valve but ahead of the condenser inlet,

(k) means to close the expander by-pass conduit, open the compressor by-pass conduit, activate the expander and the liquid pump, inactivate the compressor and close the expansion valve, when the temperature of the atmospheric air flowing through the cooling tower is at least low enough to condense refrigerant vapor in the cooling tower heat exchanger at a pressure lower than the pressure of the refrigerant vapor exiting the condenser, to thereby extract energy by means of the expander for use in producing power or work,

(l) means to close the expander by-pass conduit, close the compressor by-pass conduit, activate the expander and the compressor, open the expansion valve or activate the liquid pump, when the temperature of the atmospheric air flowing through the cooling tower is in the middle of the ambient temperature range to effect efficient heat exchange and condensation of the refrigerant in the cooling tower heat exchanger, and

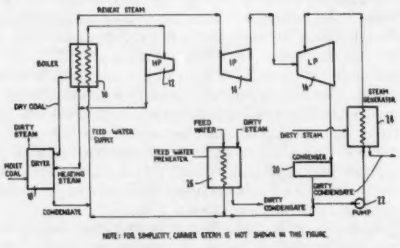
(m) means to open the expander by-pass conduit, close the compressor by-pass conduit, activate the compressor and open the expansion valve, and inactivate the expander and the liquid pump, when the temperature of the atmospheric air flowing through the cooling tower is close to being too high to effect efficient heat exchange and condensation of the refrigerant in the cooling tower heat exchanger without compressing the refrigerant.

4,291,539

POWER GENERATION SYSTEM

Owen E. Potter, Camberwell, Australia, assignor to Monash University, Victoria, Australia

Filed Dec. 29, 1978, Ser. No. 974,244
Claims priority, application Australia, Feb. 10, 1978, PD3342
Int. Cl.³ F01K *21/00*
U.S. Cl. 60—670 **11 Claims**



1. An electrical power generation system comprising means for burning solid carbonaceous fuel to generate heat energy which is used to convert water to steam, at least one turbine means driven by the said steam for producing electrical en-

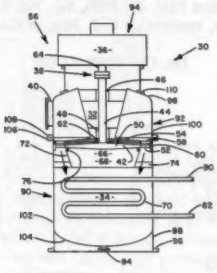
ergy, and solid carbonaceous fuel drying means, in which moist fuel is indirectly heated by steam in the drying means and dried fuel is passed to the burning means; characterized in the moist fuel is heated in the drying means in the absence of introduced air or other gases, whereby water vapour substantially free from air or other gases is driven off from the fuel for further use.

4,291,540

POWER GENERATION UNIT

J. Rodger Shields, Pittsburgh, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,517
Int. Cl.³ F01B *31/16*
U.S. Cl. 60—694 **1 Claim**



1. A power generation unit comprising:

a turbine for extracting energy from a vaporous power fluid and including an inlet scroll for directing the power fluid generally downward through the turbine, a generally vertical, rotatable turbine shaft, a turbine wheel supported by the turbine shaft for rotation therewith and having a hub and a plurality of blades extending outward therefrom wherein the flow of the power fluid past the turbine wheels causes rotation thereof, and a vapor discharge port;

an electric generator for generating an electric current and including a generally vertical, rotatable power shaft aligned with the turbine shaft;

a shaft coupling connecting the turbine shaft and the power shaft to transmit rotary motion from the turbine shaft to the power shaft to generate an electric current;

a condenser located directly below the turbine, and including a condenser heat exchanger for condensing the vaporous power fluid and a vapor inlet port;

a baffle having a first end located directly below the turbine wheel, extending downward and inward therefrom, toward and into the condenser, and defining an annular chamber below the turbine wheel for receiving the power fluid flowing therepast, guiding the fluid away from the hub of the turbine wheel, and conducting the fluid downward through the discharge port of the turbine, through the inlet port of the condenser, and into the condenser, wherein

the horizontal cross sectional area of the annular chamber increases in the downward direction to allow the power fluid to expand as it flows therethrough;

a casing enclosing the turbine, the electric generator, the condenser, and the baffle, and including

a top section housing the electric generator,

a middle section having a top portion, a cylindrical side portion, and an annular flange located at the bottom of the middle section,

a lower section including a cylindrical side portion having a radius substantially equal to the radius of the side portion of the middle section, a rounded bottom portion, and an annular flange located at the top of the lower section secured to the annular flange of the middle section to join the lower and middle sections together, and

a ring joining the top section to the middle section; and

bracket means extending between the baffle and the casing to support the baffle therewithin; and wherein

the discharge port of the turbine is defined by a horizontal cross sectional area of the casing below the turbine wheel, is completely open, and is substantially directly below and at least substantially coextensive with the horizontal cross section of the vapor flow path as the vapor flows past the turbine wheel, and

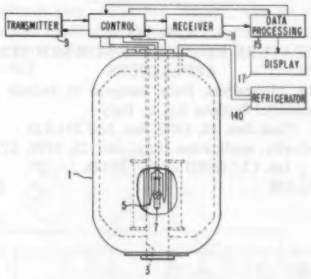
the inlet port of the condenser is defined by a horizontal cross sectional area of the casing above the condenser heat exchanger, is completely open, and is substantially coextensive with the vapor discharge port of the turbine.

4,291,541

CRYOSTAT WITH EXTERNAL REFRIGERATOR FOR SUPER-CONDUCTING NMR SPECTROMETER

George D. Kneip, Jr., Menlo Park, and Marvin H. Anderson, Mountain View, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 879,289, Feb. 21, 1978, abandoned. This application Jun. 30, 1980, Ser. No. 164,451
Int. Cl.³ F17C *1/00*
U.S. Cl. 62—45 **2 Claims**



1. In a cryostat wherein a first liquified gas is contained in a central vessel and said central vessel is surrounded by shielding means maintained at the temperature of another liquified gas of higher boiling point, said cryostat further comprising a containment vessel at ambient temperature, said containment vessel comprising a wall portion having an interior surface spaced from the outer surface of said shielding means, the improvement comprising:

a radiation shield disposed between the interior surface of said containment vessel and the outer surface of said shielding means;

mechanical refrigerating means for maintaining said radiation shield at a temperature substantially intermediate said shielding means and ambient temperature during operation.

4,291,542

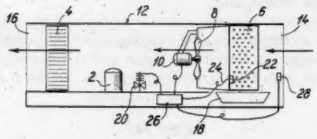
AIR DRYING APPARATUS OF THE CONDENSATION TYPE

Poul E. Sminge, Randers, and Svend I. Thoegersen, Baelum, both of Denmark, assignors to A/S Dantherm, Skive, Denmark

Continuation of Ser. No. 870,377, Jan. 18, 1978, abandoned. This application May 14, 1980, Ser. No. 149,629
Claims priority, application United Kingdom, Jan. 19, 1977, 2112/77
Int. Cl.³ F25D *21/06*; F25B *41/00*
U.S. Cl. 62—156 **11 Claims**

1. An air drying apparatus, comprising a cooler element and

a fan for creating an air flow against or through the cooler element, means for normally cooling the cooler element, means for temporarily heating the cooler element to cause defrosting thereof, and control means for controlling the operation of said heating means, characterized in that temperature sensing means are mounted in direct heat connection with said cooler element, said sensing means being operatively connected with the fan and said control means so as to cause a reduction of the fan effect in response to the cooler temperature rising above a



predetermined operational value or, respectively, so as to cause actuation of said heating means for defrosting the cooler in response to the cooler temperature falling to a predetermined minimum, and wherein an air temperature sensor is so provided and operatively connected with said temperature sensing means that the cooler element temperature level or levels, by which the sensing means perform their said control operations, are generally increased in automatic repsonse to increase of the temperature of the air as blown against the cooler element.

4,291,543

TEMPERATURE REGULATOR FOR HOUSEHOLD APPLIANCES

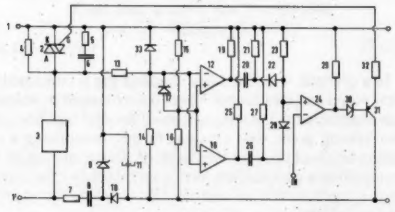
Luigi Alluto, Moncalieri, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Italy

Filed Jan. 14, 1980, Ser. No. 111,823

Claims priority, application Italy, Jan. 23, 1979, 67141A/79

Int. Cl.³ G05D *23/32;* H03K *5/153*

U.S. Cl. 62—158 **21 Claims**



1. A temperature regulator for use with an electrical household appliance, comprising:

a temperature sensor for sensing the temperature of a portion of said electrical household appliance and generating an electrical quantity related thereto;

a signal translating circuit for processing said electrical quantity and producing a control signal as a function thereof;

temperature adjusting means for adjusting said temperature;

a regulating element which receives said control signal and controls the operation of said temperature adjusting means as a function thereof;

said signal translating circuit comprising a detector circuit for detecting zero crossings of a voltage applied to said regulating element, said detector circuit comprising two voltage comparator circuits each having two input terminals and an output terminal, the input terminals of one said comparator being connected anti-parallel with the input terminals of the other said comparator such that the output terminals of said comparators provide two push-pull signals which vary sharply in amplitude at said zero crossings, said two push-pull signals being fed separately to further circuits of said signal translating circuit; and

delay means for preventing said control signal from activating said regulating element for a predetermined length of time, when said appliance is turned on, so as to allow the remainder of said temperature regulator to reach approximately its normal running condition before allowing said control signal to activate said regulating device.

4,291,544

CONTROL APPARATUS FOR THE LOW PRESSURE EVAPORATOR OF A REFRIGERATION PLANT

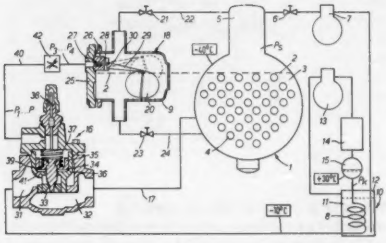
Kurt A. Larsen, Nordborg, Denmark, assignor to Danfoss A/S, Denmark

Continuation of Ser. No. 949,223, Oct. 6, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,973

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2745988

Int. Cl.³ F25B *41/04*

U.S. Cl. 62—221 **5 Claims**



1. Control apparatus for a refrigerator plant evaporator, comprising, a float type pilot valve connectable to said evaporator and having a float chamber which assumes the same liquid level as said evaporator, said pilot valve having a nozzle and closure member for adjusting the flow through said nozzle, said pilot valve having a float for controlling said closure member, a main valve connectable to said evaporator for supplying liquid refrigerant thereto, said main valve having a closure member and a differential pressure actuated servo-means for controlling said main valve closure member, pilot conduit means extending from said main valve to said nozzle of said pilot valve, first throttle means for controlling a liquid flow for operating said servo-means, said first throttle means having the inlet thereof on the supply side of said main valve and the outlet thereof in fluid communication with said pilot conduit means, and second throttling means in said pilot conduit means downstream from said first throttling means and in series relationship to said nozzle of said pilot valve for introducing a desired throttling resistance downstream of said first throttling resistance to produce a desired fluid expansion to obtain a fluid mixture having a correspondingly desired liquid/vapor ratio making said mixture optimally suitable for control by said pilot valve.

4,291,545

ABSORPTION HEAT PUMP

James R. Worsham, III, 115 Village Rd., Lynchburg, Va. 24502

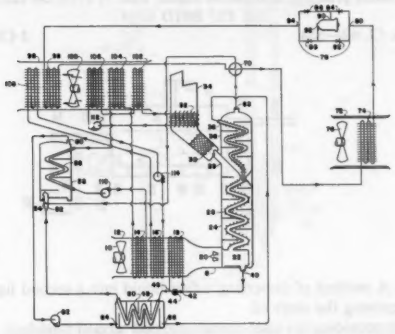
Filed Jan. 10, 1980, Ser. No. 110,964

Int. Cl.³ F25B *27/02, 15/00*

U.S. Cl. 62—238.3 **6 Claims**

1. In a heat pump system for transferring heat from one site to another employing a confined volatile solute and solvent therefor, comprising a generator which causes heat to be applied to a solution comprised of said volatile solute in said solvent, thereby causing said volatile solute to separate in gaseous form from said solution which consequently emerges

in hot condition containing little of said solute, a furnace which receives ambient air and combusts a fuel to form a heated air stream which is passed in heat exchange relationship through said generator and then through a flue, a condenser wherein said volatile solute is transformed from a gaseous form to a liquid form, an evaporator in which said volatile solute transforms from a liquid form to a gaseous form, and an absorber



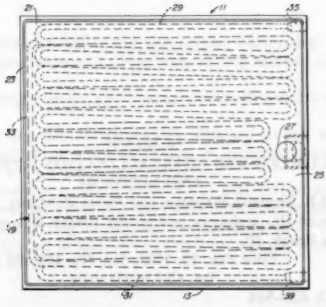
which causes said volatile solute to dissolve in said solvent with attendant generation of heat, said generator condenser, evaporator and absorber being arranged in sequential communication, the improvement comprising conduit means which obtains heat from said generator, absorber or condenser and delivers said heat to the ambient air received by said furnace, whereby the efficiency of operation of said heat pump system is improved.

4,291,546

COLD PLATE HEAT EXCHANGER

Joseph J. Rodth, Pleasant Valley, Conn., assignor to Alco Foodservice Equipment Company, Miami, Fla.

Filed Jun. 11, 1979, Ser. No. 47,645
Int. Cl.[3] B67D *5/62*; F26B *39/02*
U.S. Cl. 62—398 **13 Claims**



1. A cold plate heat exchanger for use in a beverage dispenser comprising:

a generally planar heat conducting surface having a layer of ice on one side thereof to extract heat from the beverage components;

a first tubular member to convey a liquid and positioned along the other side of said heat conducting surface, said first tubular member having first and second ends and coiled in a serpentine shape with the central axis thereof lying substantially in a plane generally parallel to said heat conducting surface to provide a large area of said heat conducting surface adjacent said heat conducting surface;

an outlet fitting located on said first end of said first tubular member to connect the heat exchanger for conveying the cooled liquid to a dispensing location;

a second tubular member to convey the liquid and positioned along said first tubular member on the side away from said heat conducting surface, said second tubular member having first and second ends and coiled in a serpentine shape with the central axis thereof lying substantially in a plane generally parallel to said heat conducting surface to provide a relatively large area of said second tubular member adjacent said first tubular member;

an inlet fitting located on said first end of said second tubular member, said first end of said second tubular member being adjacent said second end of said first tubular member; and

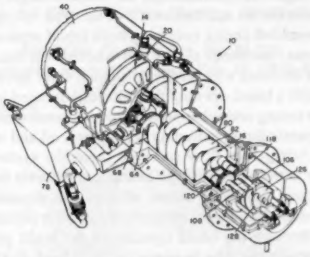
a third tubular member interconnecting said second end of said first tubular member and said second end of said second tubular member.

4,291,547

SCREW COMPRESSOR-EXPANDER CRYOGENIC SYSTEM

Bruno S. Leo, Santa Monica, Calif., assignor to Hughes Aircraft Company, Del.

Continuation-in-part of Ser. No. 894,677, Apr. 10, 1978, abandoned. This application Jun. 12, 1980, Ser. No. 158,764
Int. Cl.[3] F25D *9/00*
U.S. Cl. 62—402 **30 Claims**



1. A closed cycle cryogenic refrigeration system comprising:

a screw compressor having a housing having inlet and outlet ends, an inlet and an outlet adjacent the ends of said housing;

first and second rotors rotatably mounted within said housing, said first and second rotors respectively having intermeshing lobes and recesses configured and fitted so that compression without oil occurs in oil-free gas passing through said compressor;

an expander having an expander housing having inlet and outlet ends, an inlet adjacent one end of said expander housing and an outlet adjacent the other end of said expander housing;

first and second expander rotors rotatably mounted within said expander housing, said first and second rotors respectively having intermeshing lobes and recesses configured and fitted so that oil-free gas expansion with work output takes place upon rotation of said expander rotors in said expander housing; and

means interconnecting said inlet and outlet on said compressor housing and said inlet and said outlet on said expander housing for providing a closed cycle for the circulation of oil-free refrigerant gas therein, for rejecting heat, and for receiving heat for producing cryogenic refrigeration upon rotation of said rotors.

4,291,548

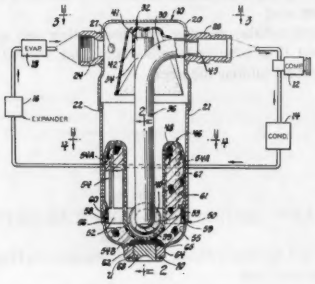
LIQUID ACCUMULATOR

J. D. Livesay, Tipp City, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 156,320, Jul. 7, 1980. This application Sep. 22, 1980, Ser. No. 189,135

Int. Cl.³ F25B *43/00*

U.S. Cl. 62—503 **2 Claims**



1. In a liquid accumulator for air conditioning systems and the like wherein the accumulator is of the type having a permanently assembled casing enclosing both liquid separator means and desiccant container means and wherein the liquid separator means includes a generally U-shaped tube having a bight portion with a bleed opening therethrough located in a bottom end of the casing and wherein the liquid separator means operates to separate liquid including refrigerant, oil and water from vaporous refrigerant flow received from the system and deposit same in the bottom of the casing and wherein desiccant in the desiccant container means adsorbs the deposited water while the deposited liquid refrigerant and oil is permitted to be returned through the bleed opening in the bight portion and thence through the tube in vaporous form back to the system: the improvement in a serviceable desiccant container arrangement comprising in combination, a porous desiccant container bag with closed ends that is foldable once on itself and is then insertable crease first in the bottom of the casing prior to insertion of the bight portion of the tube therein and permanent closure of the casing, the two folds of said bag having an outer side shaped to conform with the interior side of the casing and an inner side facing toward and spaced from that of the other fold so as to receive the bight portion of the tube therebetween, said bag at the crease therein having an opening aligned with an opening in the bottom of the casing, fitting means on both said bag and the casing extending about their respective opening for cooperating with each other to sealingly attach said bag to the casing so as to retain said bag in the bottom of the casing when the latter is inverted and also seal off the interior of said bag from the interior of the casing, and closure means for closing the opening in the casing after desiccant has been loaded therethrough into said bag whereby said bag may be gravity filled both for the first time and later in service through said opening in the casing after said casing has been permanently closed and inverted while said bag while so inverted is retained by said fitting means and whereby saturated desiccant may be drained from said bag through the opening in the casing when the casing is in its normal upright position prior to refilling.

4,291,549

METHOD OF DISPERSING A LIQUID INTO ANOTHER LIQUID

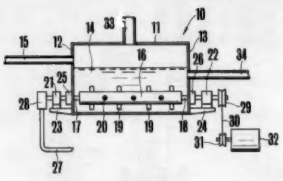
Kensuke Fujimura; Naomichi Yamamoto; Masahiro Ogawa, and Nobuyoshi Tanigawa, all of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Filed Dec. 19, 1979, Ser. No. 105,014

Claims priority, application Japan, Feb. 7, 1979, 54-12277

Int. Cl.³ B01D *9/04*

U.S. Cl. 62—534 **3 Claims**



1. A method of dispersing a first liquid into a second liqu[illegible], comprising the steps of:

(a) providing a vessel containing said second liquid;

(b) providing first liquid injecting means in said second liquid having a hollow drum with a plurality of nozzles extending therefrom, each nozzle having an orifice of predetermined dimensioning at the end thereof spaced from an outer surface of the hollow drum by a predetermined spacing;

(c) feeding said first liquid into the hollow drum and out through the orifice of each of the nozzles into said second liquid; and

(d) rotating the hollow drum at a predetermined speed as said first liquid is fed into the hollow drum, such that the dimensioning of each orifice, the spacing of each orifice from the outer surface of the hollow drum and the predetermined speed of rotating of the hollow drum coact to forcibly break up the first liquid into droplets of small diameter which do not reunite with each other after leaving each orifice, without clogging of said each orifice.

4,291,550

FLUIDIZED BED CRYSTALLIZATION APPARATUS AND METHOD

Gerald E. Engdahl, Wheaton, and James B. Maher, Oak Brook, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Feb. 14, 1980, Ser. No. 121,495

Int. Cl.³ B01D *9/04*

U.S. Cl. 62—544 **3 Claims**

1. A method of crystallizing or freezing out a component of a mixture composed of a liquid and a dissolved or suspended solid material, or both, which comprises:

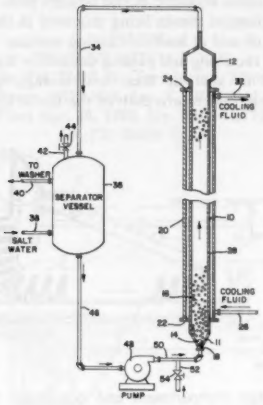
passing the mixture upwardly through a column containing a mass of insoluble metal balls having a specific gravity greater than that of the mixture;

by heat exchange to a cold fluid, indirectly cooling the mixture to a temperature at which the component crystallizes or freezes out of solution, as it flows upwardly in the column;

said component being the liquid or dissolved solid material; and

said flow of the mixture through the column being at a

sufficient velocity to fluidize the insoluble metal balls into turbulent action to scour the column inside surface and



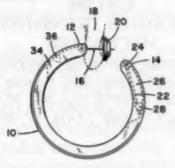
thereby prevent build up thereon of the crystallized or frozen out component.

4,291,551

COMBINATION EARRING AND FINGER RING

Harriet B. Levine, 7530 Stonecrest, Dallas, Tex. 75240

Filed Oct. 6, 1980, Ser. No. 194,628
Int. Cl.³ A44C *7/00, 9/00*
U.S. Cl. 63—12 **8 Claims**



1. A combination finger ring and earring comprising:
(a) an arcuate section of a ring body having first and second ends.
(b) an earring stem for a pierced ear attached to said first ring end,
(c) an earring fastener removably attached to and mating with said stem when said stem is inserted through a pierced ear for use as an earring, and
(d) an extension pivotally attached to said second end for rotation toward said ring body adjacent to said second end when said earring is used and for rotation toward said ring body adjacent to said first end to form a circle when said finger ring is used.

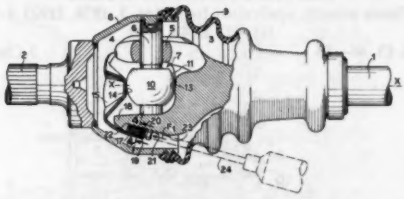
4,291,552

AXIAL RETAINING DEVICE IN PARTICULAR FOR A HOMOKINETIC TRIPOD JOINT

Michel A. Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Aug. 15, 1978, Ser. No. 933,743
Claims priority, application France, Sep. 5, 1977, 77 26874; Jul. 26, 1978, 78 22122
Int. Cl.³ F16D *3/30*
U.S. Cl. 64—21 **22 Claims**

1. In a device for retaining a first element inside a second element which is substantially in the shape of a tulip and has a plurality of branches, said device comprising a resilient fastener having a plurality of radially extending branches some of which branches of the fastener have ends engaged in cavities in the branches of the second element so as to retain the fastener on the second element with the first element interposed between the fastener and the second element; the improvement comprising a free radially outer end portion of at least one of the branches of the fastener, a first abutment means movably combined with said radially outer end portion, a second abut-



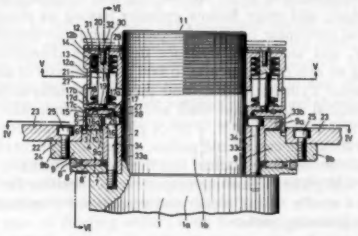
ment means on an associated branch of said branches of the second element, the first abutment means being cooperative with the second abutment means to hold the fastener on the second element in cooperation with the retaining actions of said ends engaged in said cavities, and means for adjusting the position of the first abutment means relative to said end portion whereby to adjust the position of retention of the fastener relative to the second element.

4,291,553

TORQUE LIMITER

Heizaburo Kato, and Yoshio Ogawa, both of Tokyo, Japan, assignors to Kabushikikaisha Sankyo Seisakujo, Tokyo, Japan

Filed Oct. 29, 1979, Ser. No. 88,919
Claims priority, application Japan, Feb. 16, 1979, 54-16221
Int. Cl.³ F16D *7/00*
U.S. Cl. 64—29 **4 Claims**



1. A torque limiter characterized in that a drive-transmitting body made fast on a driving member has on the outer periphery thereof several radial grooves which, in turn, hold torque-transmitting rollers of a size adapted to fit in the grooves, the upper and lower peripheral surfaces of said rollers being kept in pressure contact with the under end surface of a torque-transmitting-roller-supporting ring above said drive-transmitting body and with arcuate recesses formed on the upper surface of a driven member which is revolvably supported on the upper end surface of the lower portion of said driving member through a thrust bearing ring, a torque-spring-supporting sleeve is threadedly engaged with the outer periphery of the upper mounting portion of said driving member, and, between the top walls of open-bottom cylindrical hollows of said torque-spring-supporting sleeve and a bearing ring revolvably supported by a group of bearing balls, there are disposed a plurality of torque springs, each around one of support rods

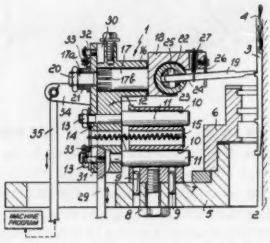
threadedly engaged at the lower end portions with said bearing ring and loosely fitted at the upper end portions in said sleeve.

4,291,554

DEVICE FOR CHANGING THE NUMBER OF THE NEEDLES AT WORK IN A CIRCULAR KNITTING MACHINE FOR STOCKINGS AND LIKE ARTICLES

Francesco Lonati, Brescia, Italy, assignor to Lonati S.p.A., Brescia, Italy

Filed Mar. 27, 1979, Ser. No. 24,291
Claims priority, application Italy, Apr. 3, 1978, 21923 A/78
Int. Cl.³ D04B *9/20*
U.S. Cl. 66—53 **3 Claims**



1. A device for changing the number of needles at work in a circular knitting machine of the type having at least one needle cylinder and means for reciprocating said at least one needle cylinder, the device comprising a picker for needle raising and lowering during reciprocation of said at least one needle cylinder, a supporting body for said picker, a shaft having a longitudinal axis extending substantially radially with respect to said at least one needle cylinder and rotatably housed in said supporting body about said longitudinal axis, a block secured to one end of said shaft, a pair of coaxial cylinders rotatably housed within said block, said cylinders including an inner cylinder and a hollow outer cylinder and having a common axis perpendicular to an intersecting said longitudinal axis of said shaft, said outer hollow cylinder having an elongate peripheral rectilinear opening for passage and movement of said picker, and said inner cylinder defining a diametrical seat having an axis perpendicular to said common axis of said inner and outer cylinder and to said picker and intersecting said longitudinal axis of said shaft and said common axis of said inner and outer cylinder, a pivot pin in said diametrical seat penetrating one end of said picker, and means for rotating said shaft about said longitudinal axis through substantially 180° to cause said picker to assume respectively a position for operating as a needle raising picker and a position for operating as a needle lowering picker.

4,291,555

MACHINES FOR THE WET TREATMENT OF FABRICS IN ROPE FORM

Bernard Barriquand, Roanne, France, assignor to Barriquand, Roanne, France

Filed Oct. 24, 1979, Ser. No. 88,067
Claims priority, application France, Oct. 27, 1978, 78 30557
Int. Cl.³ D06B *3/20, 3/24, 23/08*
U.S. Cl. 68—13 R **39 Claims**

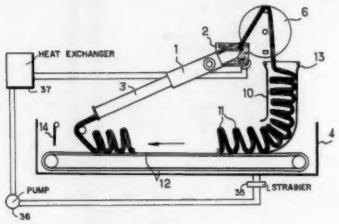
10. A processing machine notably for the dyeing of fabrics in rope form, equipped with a dyeing system and including respective means for circulating a dye bath, means for storage and means for folding, the machine comprising in combination.

at least one storage compartment having an exit;

at least one dyeing system arranged above and slightly beyond said exit of said at least one storage compartment, said dyeing system having an exit and defining an upward path for the fabric;

mechanical means for returning the fabric to said at least one storage compartment via a downward return path after passage of the fabric into and out from said at least one dyeing system arranged in said upward path of the fabric, said mechanical means being mounted in the vicinity of said exit of said at least one dyeing system;

at least one receiving and guiding device for the fabric being returned to said at least one storage compartment mounted in said return path of the fabric to said at least



one storage compartment and positioned beyond said mechanical means; and

wherein said at least one fabric storage compartment is provided with means for moving the fabric relative to said at least one compartment; and

further comprising temperature-regulating means for said dye bath; and

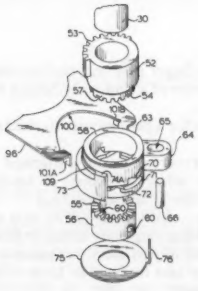
means for purifying said dye bath before its recycling in the machine.

4,291,556

AUTOMATIC WASHER TRANSMISSION SHIFT MECHANISM

Anthony Mason, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 4, 1979, Ser. No. 35,935
Int. Cl.³ D06F *23/04, 37/40*
U.S. Cl. 68—23.7 **9 Claims**



1. In an automatic laundry appliance having a reversible rotary drive means, eccentric means providing an eccentric motion for translating rotary motion of said drive means into oscillatory motion, and a clutch means for transmitting and oscillatory motion to an agitation means extending into a wash tub, a shifter means for said clutch comprising:

means operable to cause engagement and disengagement of said clutch means; and

control means mounted on and driven by said eccentric means for eccentric motion therewith, said control means responsive to a change in direction of rotation of said reversible rotary drive means to operate said means operable to cause engagement and disengagement of said clutch

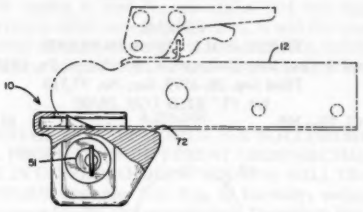
means when a change in direction of rotation of said rotary drive means occurs.

4,291,557

TRAILER HITCH LOCK

Marshall Bulle, 918 Third St., Farmington, Minn. 55024, and Dale A. Johnson, 6336 19th Ave. S.,, Richfield, Minn. 55423

Filed Apr. 28, 1980, Ser. No. 144,773
Int. Cl.³ B60D *1/12*
U.S. Cl. 70—58 **4 Claims**



1. An anti-theft device for a trailer having a ball hitch of the type comprising a generally spherical socket member having an opening for receiving a ball member and a flange extending outwardly and surrounding said opening, said device comprising:

(a) a body member having a generally planar surface and surrounded on three sides by a U-shaped recess adapted to slidingly engage said flange on said socket member, a first bore extending normal to said planar surface and a predetermined distance into said body member, and a transversely extending second bore intersecting with said first bore;

(b) a spring loaded bolt member having a ramp surface formed on an end segment thereof disposed in said first bore with said ramp surface extending above said planar surface and into said opening of said socket member when said U-shaped recess engages said flange and when said spring is extended and retractable within said bore and below said planar surface when said spring is compressed;

(c) a floating stop member disposed in said first bore for allowing depression of said ramp surface below said planar surface when in a first orientation and for preventing said depression when in a second orientation; and

(d) a key operated cam element disposed in said second bore, said cam element cooperating with said floating stop member to move said stop member to said first orientation.

4,291,558

PROCESS OF ROLLING IRON-SILICON STRIP MATERIAL

Pat A. Santoli, Natrona Heights., and Howard E. Baybrook, New Kensington, both of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Jul. 27, 1979, Ser. No. 61,323
Int. Cl.³ B21B *3/02*
U.S. Cl. 72—38 **7 Claims**

1. An improved method of reducing hot rolled band to final gage iron-silicon alloy steel strip material to retain the magnetic qualities of the final gage strip material in the annealed condition, comprising the steps of passing the material in an intermediate and in a final cold rolling operation to accomplish progressive gage reduction prior to final annealing of the material,

wherein the improvement comprises:

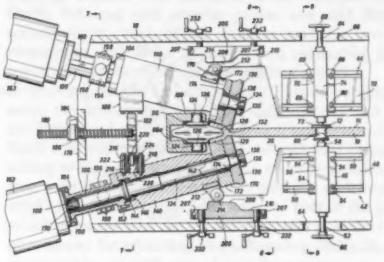
heating the material between the intermediate and the final cold rolling operations in a non-oxidizing atmosphere to a temperature and for a time of at least that necessary to recover the cold worked structure in the material and to relieve residual stresses in the material and less than that at which grains of the material begin to recrystallize.

4,291,559

SHEAVE MAKING APPARATUS AND METHOD

Charles F. Martin, P.O. Box 197, Porter, Tex. 77365

Filed Jul. 30, 1979, Ser. No. 61,923
Int. Cl.³ B21H *1/04*
U.S. Cl. 72—84 **34 Claims**



1. Apparatus for forming an external annular radial groove in the periphery of a circular workpiece comprising:

support means for supporting said workpiece for rotation about its own axis;

at least one groove-forming tool having a working surface for extending radially into the periphery of said workpiece;

tool guide means adjacent said support means and carrying said tool for movement past said workpiece in a path such that the outer extremity of said working surface passes generally tangentially to the locus of the bottom of a groove to be formed by said tool in said workpiece;

tool drive means associated with said tool guide means for moving said tool in said path;

a pair of drive rollers mounted on said support means for rotation about respective axes disposed angularly with respect to the axis of said workpiece and having respective opposed generally radially outwardly facing drive surfaces disposed for engagement with respective axially opposite sides of said workpiece distal the axis of said workpiece, and means for rotating said rollers about their respective axes to thereby rotate said workpiece about its axis;

radial drive means for moving said drive rollers generally radially outwardly with respect to said workpiece and toward said working surface of said tool;

and a pair of floating rollers each mounted coaxially with and radially outwardly of a respective one of said drive rollers, said floating rollers defining opposed forming surfaces for contacting and forming external areas of said workpiece.

4,291,560

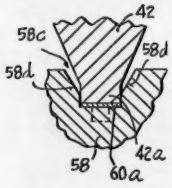
HIGH-PRODUCTION METHOD FOR MAKING GROOVED RESISTANCE RIBBON FOR ELECTRICAL HEATING COILS

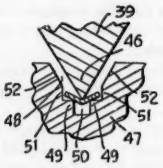
Laurence G. Horwitt, 226 Fountain St., New Haven, Conn. 06515

Division of Ser. No. 908,098, May 22, 1978, Pat. No. 4,184,351. This application Apr. 18, 1979, Ser. No. 31,002
Int. Cl.³ B21D *17/04*
U.S. Cl. 72—186 **9 Claims**

1. A high-production method of producing successive grooved strips of predetermined length, of electrical resistance ribbon for use in making heating coils of cigar lighters, ignitor plugs and the like, which includes the steps of feeding a flat ribbon of resistance wire having a fixed, predetermined uni-

form width with opposite longitudinal edges, from a continuous supply spool of the same, to and between a pair of cooperable male and female die rolls, said female die roll having a circumferential groove including a pair of oppositely-facing guide walls and having circumferentially-extending peripheral portions characterized by a V-shaped cross-sectional surface, positively engaging said ribbon along said opposite longitudinal edges and closely positioning the ribbon between said facing guide walls of the groove whereby central portions of the ribbon are centralized against the female roll, supporting





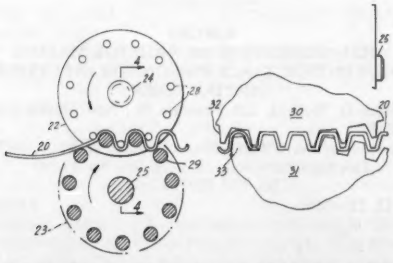
one flat side of the ribbon by said female roll along spaced-apart areas adjacent the longitudinal edges of the ribbon, and imparting a force by the male die roll to the opposite flat side of the ribbon at locations intermediate said spaced-apart areas of support for the ribbon while simultaneously turning said die rolls in opposite directions through a predetermined angle, such that there is formed in the ribbon at carefully controlled points therealong a predetermined transverse, essentially V-shaped cross-sectional configuration extending for a predetermined length thereof which is short of said predetermined length of the strip.

4,291,561

METHOD AND APPARATUS FOR FORMING CLIPS

Maynard J. G. Tipper, P.O. Box 23861, Oakland, Calif. 94623

Filed Feb. 7, 1980, Ser. No. 119,400
Int. Cl.³ B21D *53/36*
U.S. Cl. 72—187 **8 Claims**



1. The method of making connected flat clips for tying the necks of bags and the like comprising the steps of:

providing an elongated ribbon of generally flat metallic material,

bending said ribbon at spaced points along its length alternately in opposite directions to form a continuous length of generally sinusidal shaped similar connected elements, and

thereafter deforming the crests of the sinuoidal elements of said continuous length to generally trapezoidal shaped elements, whereby

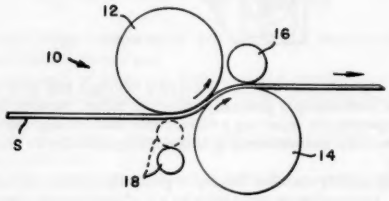
each of said trapezoidal elements may subsequently be separated from said length to provide a tie adapted to surround the neck of a bag or the like.

4,291,562

THREE ROLL TENSION STAND

Howard S. Orr, 2080 Outlook Dr., Pittsburgh, Pa. 15241

Filed Sep. 20, 1979, Ser. No. 77,310
Int. Cl.³ B21B *1/28, 39/08*
U.S. Cl. 72—205 **14 Claims**



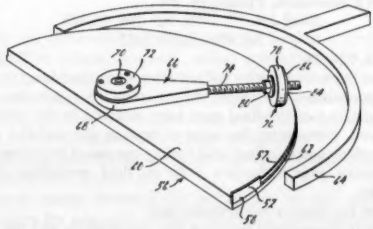
1. The method of reducing a metal workpiece at elevated temperatures to produce a strip like product which comprises feeding said workpiece to a first roll and wrapping it around a substantial arc thereof, positioning a second roll with respect to said first roll to provide a roll pass therewith at the exit end of said wrap around said first roll, positioning a third roll with respect to said second roll to provide a second roll pass to give the desired thickness of said strip like product, said workpiece engaging the surface of said second roll between said roll passes, the arc of wrap around each of said first and second rolls being less than 90°, rotating said second roll at a peripheral speed substantially greater than that of said first roll, and rotating said third roll at a peripheral speed at least as great as that of said second roll.

4,291,563

METHOD OF MAKING L-SEAL FOR GAS TURBINE REGENERATOR

John J. Lewakowski, and Theodore M. Ciagala, both of Warren, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 25, 1978, Ser. No. 954,509
Int. Cl.³ B21D *11/10*
U.S. Cl. 72—216 **2 Claims**



1. A method of forming a flat strip of material into a curved

seal of L-shaped cross section suitable for use in a gas turbine regenerator comprising the steps of:

A. placing said strip flat against a substantially semicircular die and bending said strip to said desired curved configuration;

B. rigidly clamping a flat longitudinal portion of said strip against said die while leaving an adjacent portion of said strip standing free;

C. engaging a curved roller rotatably mounted adjacent a surface of said die proximate said free standing portion about an axis normal to the axis of said semicircular die with said free standing portion; and

D. incrementally moving said roller radially and rotatively with respect to said die axis against said free standing portion to effect incremental forming of said free standing portion to make a curved concave leg portion defining an oblique angle with said clamped longitudinal portion.

4,291,564

METHOD OF AND APPARATUS FOR ROLLING SHEET STEEL PROFILES OF DIFFERENT CROSS-SECTIONAL SHAPE IN UNIVERSAL BEAM ROLLING MILL TRAINS

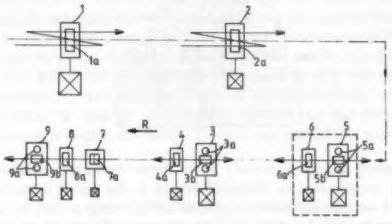
Heinz Muckli, Ratingen, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 17, 1979, Ser. No. 104,381

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855287

Int. Cl.³ B21B *1/12*

U.S. Cl. 72—234 **11 Claims**



1. An improvement in a method of rolling steel sheet profiles of different cross-sectional shape in universal beam rolling mill trains wherein starting material is rolled in a two-high reversing ingot rolling mill, in a two-high reversing preliminary rolling mill, and in at least one universal rolling mill having an associated flange edging mill, rolling taking place in each instance by means of reversing operation and in plural sequences of passes, the material then being rolled to the final finishing profile in a following finishing rolling mill, the improvement comprising the following steps taking place continuously an unidirectionally:

initially preliminary bending the material profile to a starting shape with interlock joints and inner profiles;

shaping the interlock joints and the inner profiles suitably for the final profile; and

subsequently performing a final finishing pass in which the cross-section of the sheet profile is dimensioned and shaped to its final profile.

4,291,565

WIRE DRAWING DEVICE

Albert A. Saunders, Bellefonte, Pa., assignor to ASA Enterprises, Inc., Wis.

Filed Aug. 22, 1979, Ser. No. 68,788

Int. Cl.³ B21C *1/30*

U.S. Cl. 72—290 **11 Claims**

1. A device for drawing and feeding drawn wire intermittently to a wire consuming machine, said device comprising:

a support member for being fixedly mounted and having a bore,

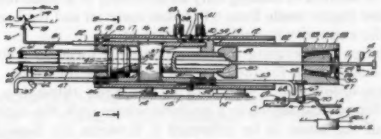
wire feeder means including a cylinder having axially spaced apart first and second pistons thereon, said pistons being jointly axially reciprocable in sliding sealing fashion in said bore, and a wire gripper supported from said first piston at a fixed distance therefrom, said feeder means being advanceable toward and retractable away from said consuming machine,

annular means surrounding said cylinder within said bore for defining isolated first and second air volumes, respectively, between said annular means and said first and second pistons, each of said volumes having a port communicating with it for admitting and exhausting air, respectively, on each side of said annular means,

wire drawing means including a third piston reciprocable under the influence of hydraulic fluid inside of said cylinder means and a piston rod on which said third piston is fixed, said rod extending axially through said cylinder in sliding sealing fashion and having an axial hole coextensive with its length to provide a path for undrawn wire stock, said hole being aligned with the part of the gripper which grips the wire during drawing, said cylinder having port means for admitting and exhausting hydraulic fluid, respectively, on each side of said third piston,

retaining means for a wire drawing die fixed at the end of said piston rod adjacent said first piston, a die in said means being operative to draw wire when being advanced in a direction away from said gripper and to engage with and feed wire when being retracted in a direction toward said gripper and consuming machine,

air control means having input means for pressurized air,



conduits for coupling said air control means to the respective ports communicating with the first and second air volumes in the cylinder of said feeder means,

said air control means responding to said feeder means being retracted away from said consuming means by supplying air pressure through one conduit to said first volume between said first piston and annular means and permitting air exhaust from said second volume through the other conduit when said feeder means is retracted to initiate advancement thereof and responsive to said feeder means being advanced by supplying air pressure through said other conduit to said second volume between said second piston and annular means and permitting air exhaust through said one conduit from said first volume when said feeder means is advanced to initiate retraction thereof,

said air control means being responsive to said feeder means being intermediate of retracted and advanced positions by discontinuing supplying air pressure to said first and second volumes when said feeder means has advanced and retracted a predetermined distance and to block exhaust of air from respectively alternate volumes for said air in said alternate volumes to undergo compression for decelerating said feeder means in a shock free manner at the end of its advancement and retraction strokes,

hydraulic fluid control means having input means for pressurized hydraulic fluid,

conduits for coupling said hydraulic fluid control means to the respective ports of said cylinder,

said hydraulic fluid control means responding to said feeder means having advanced by said predetermined distance by supplying fluid pressure to one side of said third piston to aid in advancing said piston and to produce a reverse reactive force on said feeder means while said feeder

means is being advanced by said air pressure to thereby cooperate with said feeder means in advancing drawn wire,

said hydraulic fluid control means responding to said feeder means having been advanced to a limit and subsequently retracted by applying fluid pressure to the other side of said third piston for said fluid pressure to move said third piston in said cylinder in the retraction direction of said feeder means and thereby draw said die over said undrawn wire stock while said drawn wire is held by said gripper.

4,291,566

METHOD OF AND APPARATUS FOR FORGING METAL

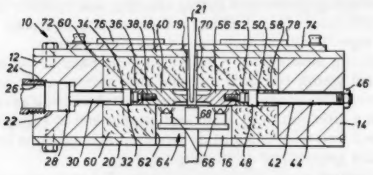
Raymond Dinsdale, Colne, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 10, 1979, Ser. No. 73,875

Claims priority, application United Kingdom, Sep. 16, 1978, 37111/78

Int. Cl.³ B21K *3/04*

U.S. Cl. 72—342 **10 Claims**



1. A method of heating only an extremity of a blade for a gas turbine engine made from a titanium material and then reforming the extremity including the steps of:

heating cooperating movable dies of a forge to a forging temperature for the titanium material of the blade;

then inserting the extremity of the blade through a close fitting heat shield to a position where only the extremity of the blade to be reformed is between the heated dies with the remainder of the blade being external of the heat shield;

applying a first pressure by the heated cooperating dies on the extremity of the blade to clamp the same therebetween and maintaining the clamping pressure of the dies on the extremity of the blade until heat is transferred from the dies only to the extremity of the blade and raises the temperature of the extremity of the blade to the forging temperature of the titanium material; and

after forging temperature for the titanium material of the blade has been reached in the extremity of the blade, then increasing pressure of the cooperating dies on the extremity of the blade to a forging pressure sufficient to achieve displacement of material at the extremity of the blade.

4,291,567

EASILY OPENABLE CONTAINER CLOSURE HAVING A SHELL AND A SEALING MEMBER, APPARATUS FOR PRODUCING THE SAME

Kashiwa Murayama, Fujisawa, Japan, assignor to Japan Crown Cork Co., Ltd., Tokyo, Japan

Division of Ser. No. 66,465, Aug. 13, 1979, Pat. No. 4,284,023, which is a division of Ser. No. 16,606, Mar. 1, 1979, Pat. No. 4,197,956. This application Aug. 25, 1980, Ser. No. 181,221

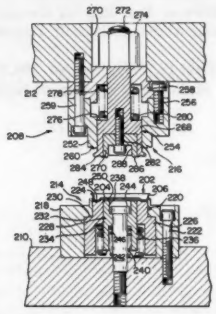
Int. Cl.³ B21D *22/00*

U.S. Cl. 72—347 **1 Claim**

1. A press-forming device for inclining a cylindrical skirt of a shell inwardly toward its free end and forming a curl at the free end, said shell including a circular top and the skirt, said device comprising a pair of support plates capable of relatively moving toward and away from each other, a first press tool assembly mounted on one of said support plates, and a second press tool assembly mounted on the other support plate, said first and second tool assemblies acting cooperatively and pressing said shell between them when said pair of support plates relatively more toward each other,

said first press tool assembly including a first tool fixed to one of said pair of the support plates and having an annular engaging surface facing inwardly in the radial direction and adapted to be engaged with at least a part of the outside surface of the skirt of the shell during press-forming, and a second tool having an engaging surface adapted to be engaged with at least a part of the outside surface of the top portion of the shell at a position inwardly of the annular engaging surface of the first tool in the radial direction during press-forming, said second tool being mounted on said one support plate of said pair slidably over a predetermined range in the direction of the relative movement of said pair of support plates and being elastically urged toward the other of said pair of supporting plates,

said second press tool assembly including a third tool fixed to said other support plate of said pair and having an annular engaging recess defined by an annular inside



surface facing outwardly in the radial direction, an annular outside surface facing inwardly in the radial direction and an annular bottom surface for forming a curl at the free end of the skirt upon engagement therewith during press-forming, and a fourth tool having an engaging surface adapted to be engaged with at least a part of the top of the shell during press-forming, said fourth tool being mounted on said other support plate of said pair slidably over a predetermined range in the direction of the relative movement of said pair of support plates and being elastically urged toward said one support plate of said pair,

said annular inside surface of said annular engaging recess of the third tool being positioned inwardly of the annular engaging surface of the first tool by a predetermined dimension larger than the thickness of the skirt of the shell, and the outer peripheral edge of said engaging surface of the fourth tool and its side surface following said peripheral edge being positioned substantially at the same position in the radial direction as the annular inside surface of the annular engaging recess of the third tool, or inwardly thereof.

4,291,568

METHOD OF FORMING SOCKET WRENCHES

Vincent A. Stifano, Jr., Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

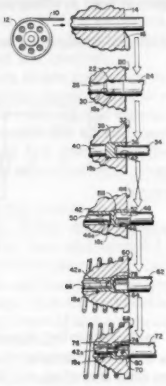
Filed Aug. 27, 1979, Ser. No. 70,060

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—356 **13 Claims**

1. A method of cold forming socket wrenches comprising the steps of providing a generally cylindrical solid metal workpiece, aligning the workpiece with an internal cavity of a die, driving the workpiece into the die cavity with a power oper-

ated punch and simultaneously forming a first recess in one end of the workpiece in aligned relation with its longitudinal axis by cold flowing its metal material between the punch and die, transferring the workpiece from the first die and longitudinally reversing the workpiece end to end into alignment with an internal cavity of a second die, driving the workpiece into the cavity of the second die with a second power operated punch and simultaneously forming a second recess in the opposite end



of the workpiece in coaxial alignment with its first recess by cold flow of the workpiece metal material about the second punch and the second die, and reducing the outside diameter of one end of the workpiece by driving it into a tapered die cavity and extruding the metal material of the workpiece between a third punch, received within the recess in said one end of the workpiece, and internal walls of the tapered die which are located in spaced surrounding relation to the third punch received within the recess in said one end of the workpiece.

4,291,569

HYDRAULIC PRESS

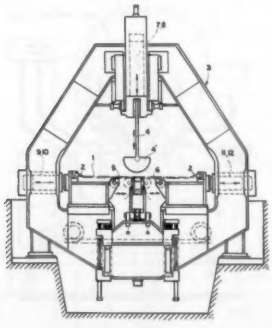
Hans-Joachin Breiding, Krefeld-Fischeln, and Manfred Bachen, Krefeld, both of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Mar. 26, 1980, Ser. No. 134,267

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2911901

Int. Cl.³ B21D *5/00*

U.S. Cl. 72—403 **8 Claims**



1. A hydraulic press assembly for forming U-shaped profiles in the production of pipe sections, comprising:

a supporting frame;

vertically reciprocatable press means carried by said frame for bending a rectangular plate during a first phase of a deformation process;

first horizontally reciprocatable press means on said frame;

second horizontally reciprocatable press means mounted on said frame and operating in a common plane with said first horizontally reciprocatable press means for coacting therewith in bending a plate during a second phase of a deformation process;

aligning means on said frame for centering a plate with respect to said press means prior to said first phase;

hydraulic drive means on said frame for actuating said press means, said drive means including a plurality of hydraulic cylinders for operating each horizontally reciprocatable press means;

electronic control means operatively connected to said drive means for sequencing the actuation of said press means; and

synchronization means on said frame for centering a plate with respect to said press means during said first and second phases, said synchronization means including position monitors engageable with a plate for detecting the position and orientation thereof, said control means being operatively connected to said synchronization means for selectively adjusting, via said drive means, the pressurization of said cylinders in response to signals from said monitors.

4,291,570

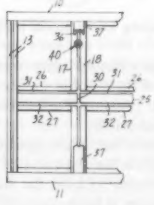
STRAIGHTENING APPARATUS FOR VEHICLE BODIES

Walter D. Whitney, 1420 Industrial Way, San Carlos, Calif. 94070

Filed Apr. 30, 1979, Ser. No. 34,442

Int. Cl.³ B21D *11/22*

U.S. Cl. 72—447 **5 Claims**



1. Apparatus for straightening vehicle bodies and frames comprising:

a generally rectangular vehicle support,

said support including a pair of relatively heavy longitudinally extending strength members and a pair of transversely extending strength members,

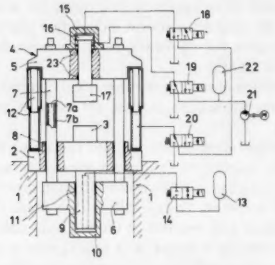
the members of each of said pairs being spaced apart horizontally to define a slot therebetween with said slots in communication with each other at the intersection of said longitudinal and transverse pairs to define a passageway having two runs in intersecting and communicating relationship, and

a hanger extending vertically within said passageway and adapted to slide at its upper end on said strength members to any point in said passageway.

4,291,571
FORGING PRESS

Paul O. Claussen, Willich, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,539
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852303
Int. Cl.³ B21J 9/12
U.S. Cl. 72—453.18 5 Claims



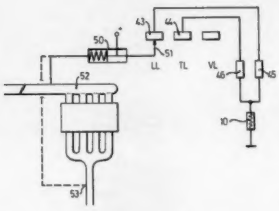
1. A forging press having
a fixed cross head,
a die carrier on the fixed cross head, for a lower die,
a movable press frame comprising a top cross head above and a bottom cross head below the fixed cross head, and tie beams connecting the top and bottom cross heads,
vertically extending guides through the fixed cross head for guiding the tie beams so that the top cross head of the press frame is moved towards and away from the fixed cross head when the press frame is moved,
a first piston/cylinder unit arranged between the fixed cross head and the bottom cross head,
a source of low pressure fluid connected to the first piston/-cylinder unit via a closable valve, for moving the press frame relative to the fixed cross head,
a second piston/cylinder unit associated with the top cross head,
means for retracting the piston of said second unit,
a die carrier for an upper die on one end of the piston of said second unit,
means for operating said second unit to carry out a forging operation,
retraction piston/cylinder units arranged between the top cross head and the fixed cross head, and
a source of high pressure fluid connected to the retraction piston/cylinder units,
said retraction units being arranged to operate in opposition to said first unit, when the valve of the fluid source for said first unit is closed, to hold the frame stationary while a forging operation is being carried out.

4,291,572
METHOD AND SYSTEM FOR CONTROLLING THE TEMPERATURE OF A HEAT MEASURING SENSOR ESPECIALLY IN MOTOR VEHICLES

Helmut Maurer, Schwieberdingen; Gerhard Dillman, Markgrö ningen; Franz Rieger, Aalen-Wasseralfingen, and Ernst Linder, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 924,407, Jul. 13, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,922
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731541
Int. Cl.³ G01N 27/12
U.S. Cl. 73—23 10 Claims

1. A temperature control for a measuring sensor located in the exhaust gas line of an internal combustion engine of an automotive vehicle comprising:
a measuring means,
a heating element for controlling the temperature of said measuring means;
a plurality of control mechanisms including said measuring means for measuring a control quantity and being selectively coupled in series with said heating element for determining at least three ranges including a variable heating performance at least at idling range and at partial-load range;
means selecting one of said plurality of said control mechanisms including said measuring means, said selecting means selecting a selected characteristic operating quantity of said engine load including air flow rate measurement connecting one of said selected control mechanisms to said heating element for controlling the variable heat output of said heating element according to the measured quantity in at least two of said ranges, said automotive vehicle including a throttle valve rotatably fixed to move in an arc by a vehicle operator;

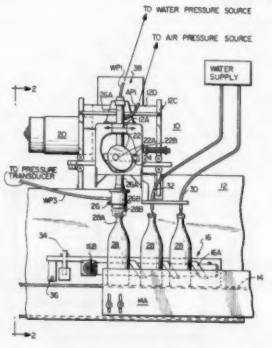


means responsive to the position of said throttle valve to provide a stepped signal output; and
means for receiving said stepped signal output to vary the heat output of said heating element.

4,291,573
REJECT SYSTEM FOR IN-LINE PRESSURE TESTING SYSTEMS

Simon J. Richter, Marietta, Ga., and Michael Sanscharowskiy, Horseheads, N.Y., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Dec. 28, 1978, Ser. No. 973,918
Int. Cl.³ G01M 3/32
U.S. Cl. 73—37 23 Claims



1. Means for testing the integrity of each of a series of liquid filled—liquid tight containers being conveyed in a uniformly spaced and timed sequence past a testing station comprising:
a machine frame defining a test location;

conveyor means on said machine frame for conveying said containers in a uniformly spaced sequence past said test location in continuous motion;

a source of fluid pressure;

hydrostatic pressure head means sealably engaging said containers and applying pressure from said fluid pressure source to the interior of each of said containers during translation thereof through said test location for a corresponding test interval;

pressure sensing transducer means connected with said pressure head means providing an output signal of a magnitude corresponding to said pressure applied to said container during each said test interval;

threshold detecting means responsive to said output signal for providing a control signal output in response to a predetermined threshold value of said output signal;

enabling means responsive to said control signal output for assuming at least first and second states in response to the occurrence and non-occurrence, respectively, of said control signal;

a source of operating power;

interrogate timing means interconnected with said source of operating power and said enabling means for cyclically applying operating power to said enabling means in coordination with the application of pressure to each of said containers at said test location and commencing at a given time in each said test interval and continuing for a predetermined interrogation duration;

reject cycle timing means responsive to one of said states of said enabling means and said interrogate timing means for enabling a reject cycle for a predetermined enabling duration occurring at a time subsequent to a corresponding test interval;

reject apparatus control means responsive to said reject cycle timing means for initiating and terminating said reject cycle over a reject cycle duration at least as great as and concurrently initiated with the enabling duration of said reject cycle timing means; and

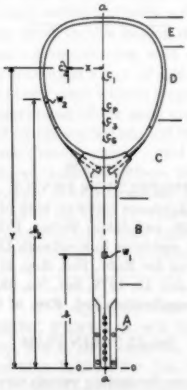
reject apparatus means actuated by said reject apparatus control means and located downstream of said test station for clearing said conveyor of a said container or any part thereof which occasioned the last prior enablement of said reject cycle timing means.

4,291,574

TENNIS RACKET

Jack L. Frolow, 2 Willow Dr., Apt. 3B, Ocean, N.J. 07712

Division of Ser. No. 646,848, Jan. 5, 1976, Pat. No. 4,165,071.
This application Mar. 26, 1979, Ser. No. 23,761
Int. Cl.³ G01M *1/12*; A13B *49/04*
U.S. Cl. 73—65 **22 Claims**



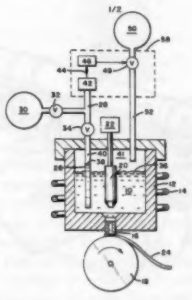
1. A method of rating a racket having a predetermined striking power, said racket having at least a head portion and a grip portion; a first axis through the center of said head portion and through the center of said grip portion; a second axis perpendicular to said first axis being located near the end of said grip portion; said racket having a moment of inertia about said second axis, said moment of inertia having a numerical value I_s, said numerical value I_s being determined by said predetermined striking power; said racket having a weight W; said racket having a center of gravity located at a distance Cg from said second axis; said racket having a center of percussion located at a distance Cp from said second axis, said center of percussion being taken about said second axis; said numerical value I_s being directly proportional to the product of said distance Cp, said distance Cg, and said weight W given by the formula $I_s=(Cp)(Cg)(W)$; said method comprising measuring said distance Cg; measuring said distance Cp; measuring said weight W; adjusting the distribution of said weight W along the length of said racket, thereby adjusting said distance Cp and said distance Cg, and adjusting the said weight W to obtain said numerical value I_s and thereby obtain said predetermined striking power.

4,291,575

LIQUID LEVEL MONITOR

Anthony P. Frissora, Mendham, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 27, 1979, Ser. No. 52,367
Int. Cl.³ G01F *23/14*
U.S. Cl. 73—302 **12 Claims**



1. A method for monitoring the level of a liquid in a reservoir utilizing apparatus that includes an open-ended tube having one end in pneumatic communication with a differential pressure transducer, comprising:

(a) immersing the open end of said tube in said liquid;

(b) adjusting a reference quantity of inert gas within said tube after immersion of said open end and then isolating said gas within said tube to produce a static-tube configuration thereof; and

(c) determining the level of said liquid by comparing the output of said transducer with a reference value, as said output varies with variations in said level.

4,291,576

ELECTRICAL TEMPERATURE SENSING MEANS HAVING MOISTURE TIGHT SEALS

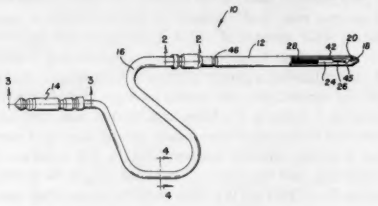
Kenneth E. Deane, Beech Grove, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jan. 21, 1980, Ser. No. 113,587
Int. Cl.³ G01K *1/08*
U.S. Cl. 73—352 **7 Claims**

1. In a temperature sensing means wherein a sensing element is carried by a probe and is electrically connected to an electrical plug through electrical connectors carried within a flexible cable,

(a) first and second moisture sealing joints formed between said cable and said probe and said cable and said electrical plug, respectively,

(b) an electrically insulative medium extending from an



outer surface of and molded into a space in said plug to prevent short circuiting of electrical conductors carried therein, and

(c) a ring carried within said space of said plug providing a moisture seal with said electrically insulative medium.

4,291,577

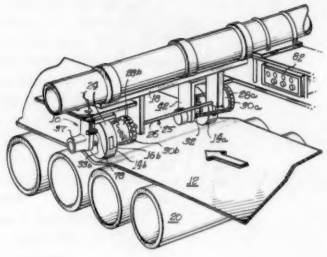
ON LINE ULTRASONIC VELOCITY GAUGE

Gary A. Baum, and Charles C. Habeger, both of Appleton, Wis., assignors to The Institute of Paper Chemistry, Appleton, Wis.

Filed Dec. 3, 1979, Ser. No. 99,410

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—597 **21 Claims**



1. A device for measuring ultrasound velocities through a moving web comprising:

a first rotating wheel having a peripheral surface for continuous surface contact with a moving web;

an ultrasound transmitting means for converting an electrical signal to ultrasonic waves which propagate through the web and located in said first wheel in position to contact the web;

a firing means for sending an electrical signal to said transmitting means when said transmitting means contacts the web;

a second rotating wheel spaced apart from said first wheel having a peripheral surface for continuous surface contact with the web;

a receiving means for converting ultrasonic waves to an electrical signal and located in said second wheel to contact the web on each revolution to receive ultrasonic waves from said transmitting means and produce therefrom an electrical signal;

filtering means receiving said electrical signal;

amplifying means receiving the filtered electrical signal and disposed in said second wheel;

and a time metering means to measure the time of travel of the ultrasonic waves between said first wheel and said second wheel.

4,291,578

APPARATUS FOR ULTRASONIC SCANNING OF OBJECTS

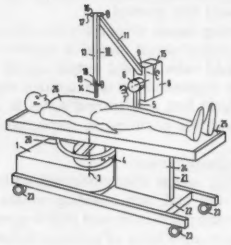
Walter Hetz, and Walter Derndinger, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 8, 1979, Ser. No. 46,700

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1978, 2826277

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—633 **19 Claims**



1. Apparatus for ultrasonic scanning of objects, in particular, the human body, comprising a floor stand having a central vertical axis, an ultrasonic scan head, an articulated arm assembly carrying the scan head, an object support for supporting an object to be scanned, the scan head being operative to effect scanning along certain scanning path configurations based on alignment of the articulated arm assembly with the central vertical axis, an extension arm (**4**) supporting the articulated arm assembly (**10**) and being coupled to the floor stand (**1**), said extension arm being rotatable about said vertical central axis (**3**) which passes through said floor stand, and said object support (**25**) being arranged above the floor stand (**1**) and above the extension arm (**4**) such that the extension arm is capable of being swung horizontally beneath said support with the central vertical axis being in alignment with the object support and defining an isocenter for the certain scanning path configurations of the scan head, the extension arm (**4**) comprising a rotary-parallel motion converter said motion converter comprising a parallelogram arm (**32**).

4,291,579

INSPECTION DEVICE

Dietgar Figlhuber; Johannes Gallwas, both of Erlangen; Robert Weber, Uttenreuth, and Jakob Weber, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,423

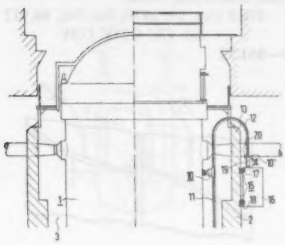
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2834108

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—636 **8 Claims**

1. Inspection device for testing vessels surrounded by a wall having an inner and an outer surface comprising a movable testing device and a track for guiding said testing device, said

guiding track extending from a portion disposed in the vicinity of the vessel between the wall and the vessel, through a U-



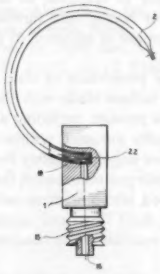
shaped portion passing over the wall and ending at a rest position for said testing device on the outer surface of the wall.

4,291,580

MANOMETER BODY

Yanko P. Kyuchukov, and Bojidar M. Srebrov, both of Varna, Bulgaria, assignors to ZM "Cherno More", Varna, Bulgaria

Filed Mar. 23, 1978, Ser. No. 889,394
Int. Cl.³ G01L *7/04*
U.S. Cl. 73—741 **1 Claim**



1. A manometer body adapted to receive an arcuate Bourdon tube and capable of being soldered thereto, comprising an elongated prismatic solid member formed at one axial end with a threaded fitting provided with a passage for connecting said body to a source of fluid whose pressure is to be measured, said member being formed within said body with an arcuate bore of generally elliptical cross section having the curvature of said Bourdon tube and communicating with said passage within said member and opening at a face of said member, said member being formed in one piece with an arcuate core of generally elliptical cross section and of the same curvature as said bore and said tube and extending within said bore to said face and ending at the plane thereof whereby said core has all around clearance of uniform crosssection from the remainder of said member in the region of said face, said core being provided with an arcuate hole of the same curvature as that of said core and said bore communicating with said passage, said hole having a generally elliptical cross section.

4,291,581

MONITORING EARTH/ROCK MOVEMENTS

Charles H. Jacoby, 959 E. Driftwood Dr., Tempe, Ariz. 85283

Filed May 1, 1980, Ser. No. 145,429
Int. Cl.³ G01N *33/24*
U.S. Cl. 73—784 **10 Claims**

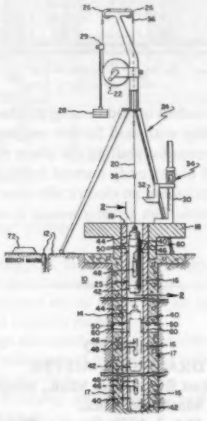
1. The method for monitoring from the earth's surface subterranean strata in situ conditions, to detect interim relative movements thereof, including the steps of:

forming a bore hole from the surface into said strata;

installing in said bore hole a casing system based on the mouth of said bore hole comprising a plurality of separate casing members disposed in said bore hole in longitudinally spaced apart relation so as to provide open window spaces therebetween;

bonding independently of one another said casing members to their corresponding strata sections;

then passing from time to time a torpedo by means of a calibrated line through said bore hole, said torpedo having pawl means automatically extendible outside of the out-



side profile thereof whenever said torpedo is lowered to such locations as to permit said pawl means to extend into intercepting relation with the window spaces between said casing members;

intermediately thereof retracting said torpedo lowering line after each pawl means extending operation, thus bringing said pawl means into firm contact holding relation with the leading end of the preceding casing member, and

concurrently reading the surveyed positions of the monitored strata sections directly from said torpedo suspension line, whereby the positions to which said separate casing members and their corresponding strata sections may have shifted in the meantime relative to one another may be monitored.

4,291,582

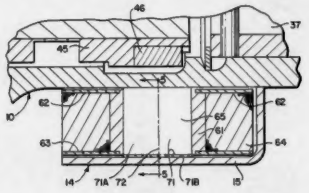
MASS RATE OF FLOW METER WITH PHASE SHIFT COMPENSATION

Colby E. Buzzell, Wilmington, and Malcolm H. Allen, Jr., Melrose, both of Mass., assignors to General Electric Company, Wilmington, Mass.

Filed Oct. 12, 1979, Ser. No. 84,398
Int. Cl.³ G01F *1/80*
U.S. Cl. 73—861.35 **12 Claims**

1. In a mass rate of flow meter including a housing means for defining a passage for a fluid, swirl generator means, unrestrained rotor means and restrained turbine means axially displaced along a first longitudinal axis extending (through) along the housing means, first sensing means including magnetic means at a predetermined point on the rotor means and magnetic flux sensing means located on said housing for producing a first pulse when said magnetic means comes into flux exchange relationship with said magnetic flux sensing means and second sensing means for detecting the passage of another predetermined point on the rotor means past a predetermined point on the turbine means, including a further magnetic means

and a further magnetic flux sensing means for producing a second pulse when the magnetic means in said second sensing means comes into flux exchange relationship with said further flux sensing means, the interval between said first and second pulses being a measure of the mass rate of fluid flow, the improvement comprising means for compensating for any phase shift in said second pulse due to eddy currents in said housing



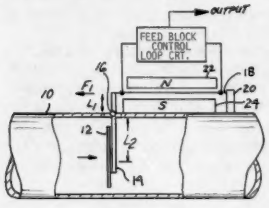
when the magnetic means in said sensing means comes into flux exchange relationship with said further magnetic flux sensing means including, means for shifting the phase of said first pulse by an amount equal to any eddy current induced phase shift in said second pulse including an electrically shorted turn associated with the magnetic flux sensing means in said first sensing means.

4,291,583

DRAG FLOW METER

James W. Bulke, West Bloomfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 1, 1979, Ser. No. 80,862
Int. Cl.³ G01F *1/28*
U.S. Cl. 73—861.75 **2 Claims**



1. A fluid flow meter for generating a linearly varying output signal having a linear variation with respect to the flow of the fluid, said meter comprising:

a conduit having a passage through which a fluid flows;

drag body means having an arm extending through the wall of said conduit and pivotally connected thereto, a drag body connected at one end of said arm and positioned transverse to the direction of the flow of the fluid, said arm pivoting in response to the flow of the fluid against said drag body;

a vibrating wire sensor having a tension wire operatively connected to the other end of said arm and responsive to the pivotal motion of said arm for varying both the longitudinal tension in said wire and the frequency of vibration of said wire;

said wire and said drag body means being fabricated from materials having matching coefficients of expansion; and

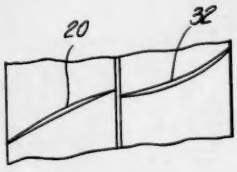
electrical signal generating means responsive to the frequency of vibration of said wire sensor and operable for generating an electrical signal varying linearly with respect to the flow of fluid against said drag body.

4,291,584

STALLED TURBINE FLOW METER

Eric G. Anderson, Rochester, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 22, 1979, Ser. No. 86,912
Int. Cl.³ G01F *1/28*
U.S. Cl. 73—861.72 **1 Claim**



1. A stalled turbine flow meter comprising:

a housing having an internal bore defining a fluid flow passage;

a turbine rotor;

means mounting said turbine rotor within said housing, said turbine rotor including at least one turbine blade configured to receive a portion of fluid flowing through said passage and to impose an angular momentum change on fluid flowing through said passage and over said at least one turbine blade developing a reaction force thereon;

bias means allowing predetermined angular displacement of said turbine rotor in response to development of said reaction force for biasing said turbine rotor against said angular displacement in response to development of said reaction force;

means varying the proportion of fluid flow directed over said at least one turbine blade with changing rates of fluid flow in said flow passage, including at least one shielding stator blade fixedly mounted within said fluid flow passage and disposed angularly offset from said at least one turbine rotor blade positioned such that said turbine rotor blade is advanced into alignment with said stator blade with increasing fluid flow and causing a lesser rate of increase in said reaction force resulting from increases in fluid flow; and

means producing an output signal corresponding to said reaction force on said turbine rotor and said signal varying in a linear relationship with fluid flow.

4,291,585

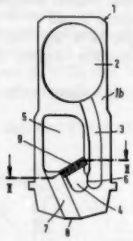
DEVICE FOR SAMPLING MOLTEN STEEL

Gustav Kolb, Garbeck, and Friedrich Bardenheuer, Krefeld, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf and Gustav Kolb, Garbeck, both of, Fed. Rep. of Germany

Filed Sep. 17, 1979, Ser. No. 76,450
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840745
The portion of the term of this patent subsequent to Apr. 16, 1996, has been disclaimed.
Int. Cl.³ G01N *1/12*
U.S. Cl. 73—863.23 **3 Claims**

1. Device for sampling molten metal including a body containing a mold cavity and duct means leading from an opening in the body to the mold cavity, the duct means including a first duct connected to the mold cavity, a mixing chamber connected to the first duct and a second duct extending between

said opening and the mixing chamber, the improvement comprising a ceramic sieve in the first duct for preventing slag



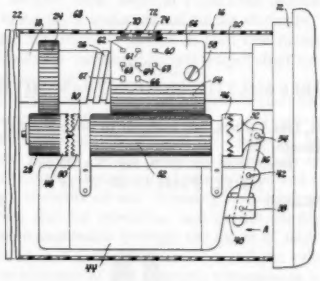
particles from passing through while retaining small slag droplets by adhesion.

4,291,586

SHIFT CONTROL MECHANISM FOR A COUNTERSHAFT TRANSMISSION

Earl H. Buetemeister, Alexandria, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 19, 1980, Ser. No. 122,471
Int. Cl.³ B60K *20/10, 20/12;* **F16H** *1/18, 1/20*
U.S. Cl. 74—335 **3 Claims**



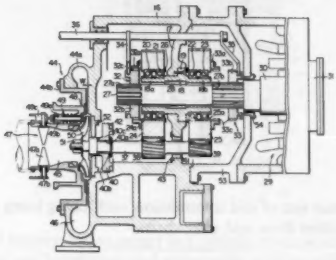
1. A control mechanism for a countershaft transmission shift control wherein the basic shift pattern is in the form of an "H" or a modified "H", said control mechanism comprising; a source of rotary input motion including an input shaft having an input gear member and a screw threaded portion; an output member including a nut threaded portion threadably drivingly connected to said screw threaded portion and an output gear member; first and second transfer gear means meshing with said input and output gear members respectively; and control means including a pair of selectively operated solenoid controlled jaw clutch assemblies for respectively connecting said first and second transfer gear means for unitary rotation and holding said second transfer gear means stationary, said output member moving linearly along the threaded connection to form the cross member of the shift control "H" pattern when said second transfer gear means is held stationary and said output member being rotated in unison with said input member to form the upstanding legs of the shift control "H" pattern when the first and second transfer gear means are rotated in unison.

4,291,587

MULTISTAGE SPEED CHANGE GEAR SYSTEM

Keiji Tachibana, Tokyo; Masatosi Terasaki; Yoshihiko Nakayama, both of Shimoinayoshi, and Junichi Kaneko, Amimachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1979, Ser. No. 55,362
Claims priority, application Japan, Jul. 17, 1978, 53/86100
Int. Cl.³ F16H *3/08*
U.S. Cl. 74—363 **16 Claims**



1. A multistage change gear system comprising:
a gear box;
at least one support means fixedly supported by said gear box, said support means including a cylindrical portion;
a bearing mounted on an inner side of said cylindrical portion of said support means;
roller bearings mounted on an outer side of said cylindrical portion of said support means, said roller bearings being at least two in number;
a first shaft rotatably journalled by said gear box through further bearings;
a second shaft rotatably journalled by said bearing mounted on the inner side of said cylindrical portion of said support means;
first gears connected to said first shaft, said first gears being at least two in number;
second gears rotatably supported by said roller bearings mounted on the outer side of said cylindrical portion of said support means, said second gears being at least two in number and adapted to mesh with said first gears; and
clutch means operative to selectively bring one of said second gears into and out of engagement with said second shaft.

4,291,588

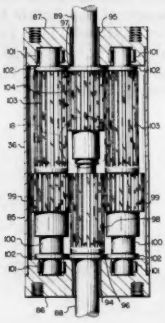
TRANSMISSION

Orien N. Justice, Dallas, Tex., assignor to CamAct Pump Corp., Dallas, Tex.

Division of Ser. No. 747,884, Dec. 6, 1976, Pat. No. 4,145,166.
This application Jan. 23, 1979, Ser. No. 5,845
Int. Cl.³ F16H *1/20*
U.S. Cl. 74—421 R **3 Claims**

1. A transmission comprising:
a housing;
input and output shafts mounted for rotation in said housing axially thereof, said shafts being axially aligned with each other and rotatively interconnected at their abutting ends, said shaft ends being mutually supportive against displacement of both relative axial position and shaft alignment to thereby reduce stress and vibration;
said input and output shafts each having a pinion mounted thereon for rotation therewith;
a pair of idler shafts mounted for rotation in said housing on opposite sides of said input and output shafts;
each of aid idler shafts carrying a pair of gears, each of said gears being meshed with a pinion;
and an electrical conduit protective tube running lengthwise through said housing for protecting an electrical conduit

delivering power from a source located away from one end of said transmission to an electric motor connected to



the other end of said transmission, said tubing being angularly offset from said idler shafts.

4,291,589

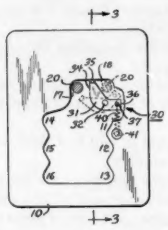
SHIFTING LEVER BRAKES OFF RESTRICTION LATCH

Edward Highland, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Nov. 19, 1979, Ser. No. 95,162

Int. Cl.[3] G05G *5/06;* **F16D** *67/00*

U.S. Cl. 74—526 **2 Claims**



1. A safety device for use with the transmission gear shift levers of a vehicle to prevent inadvertent placement of a transmission gear shift lever into one of the positions in the gear shift pattern comprising

latching means comprising a bell crank having a first arm thereof forming a barrier member and a second arm thereof forming a biasing member, said bell crank being pivotably supported about an axis disposed substantially perpendicular to the plane of said gear shift pattern at the juncture of said first and second arms adjacent to the gear shift pattern of a vehicle,

said first arm barrier member having a latch portion extending co-planar to said second arm biasing member for being urged to a position to physically isolate one position of the transmission gear shift pattern and prevent movement by the transmission shift lever into said position,

said first arm barrier member of said bell crank latching means further includes a manually operable release means extending upwardly from and substantially perpendicular to said latch portion to selectively move said latch portion of said first arm barrier member from said isolation position to an open position to permit the transmission gear shift lever to enter or leave said isolated position, and

spring means secured to a free end of said second arm biasing member to bias said latch portion of said first arm barrier member into a position physically isolating the one position of the transmission gear shift pattern.

4,291,590

MECHANISM FOR MOUNTING SIDE MIRRORS TO THE MASTER CYLINDER FOR MOTOR BICYCLES

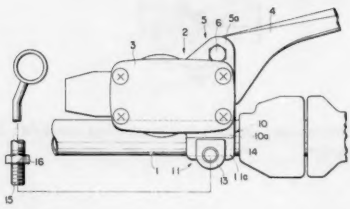
Yoshinobu Mizusaki, Ueda, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Jul. 20, 1979, Ser. No. 59,566

Claims priority, application Japan, Jul. 28, 1978, 53-103980[U]

Int. Cl.[3] B60R *1/12*

U.S. Cl. 74—551.8 **2 Claims**



1. A side mirror-mounting mechanism for mounting a brake master cylinder and a side mirror to a motorcycle handle bar wherein said master cylinder comprises a body having a handle mounting portion adapted to mount on said handle bar and embrace the same between an upper arm and a lower arm defining a semi-circular handle bar gripping surface therebetween, said mechanism comprising a handle mounting member which comprises an upper arm and a lower arm defining a semi-circular handle bar gripping surface therebetween and adapted to mate with said first-mentioned arms while embracing said handle bar therebetween, and means integral with said handle mounting member for mounting said mirror thereto at least partially sideward of above said handle bar. pg,8

4,291,591

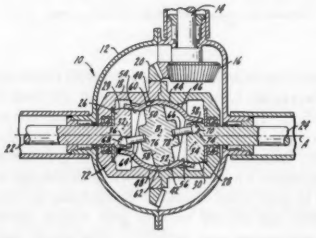
DOUBLE-SHUTTLE MOTION TRANSMITTING APPARATUS

Louis Ross, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 21, 1979, Ser. No. 22,680

Int. Cl.[3] F16H *35/04, 21/14*

U.S. Cl. 74—650 **10 Claims**



1. Motion transmitting apparatus comprising first and second shaft members rotatable on a first axis, a case member having a second axis perpendicular to said first axis, and first and second shuttle members journalled in said case member for opposite oscillation about and reciprocation on said second axis, said first and second shaft members respectively defining first and second discs at their inner ends, said discs being eccentric to said first axis, and said first and second shuttle members engaging said discs for establishing driving relationships therewith.

4,291,592
LOAD SPLITTING HYDROMECHANICAL TRANSMISSION

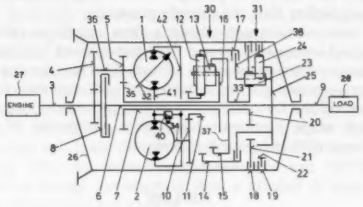
Michael Meyerle, Meckenbeuren-Lochbrücke, and Friedrich Ehrlinger, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 967,006

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758659

Int. Cl.³ F16H *47/04*

U.S. Cl. 74—687 **7 Claims**



1. A hydromechanical drive comprising:
an input shaft drivable by a prime mover;
an output shaft connectable to a load;
a hydrostatic transmission having an input side connected to said input shaft and an output side and comprising a pair of hydraulically interconnected hydraulic machines one of which is of variable volume to vary the transmission ratio between said input and output sides;
a gear-type summing transmission having one input element connected to said output side of said hydrostatic transmission, another input element connected mechanically to said input shaft, and a pair of output elements;
an output transmission having at least one output element mechanically connected to said output shaft and a pair of input elements; and
control means connected to said output transmission and the elements thereof and connectable to said output elements of said summing transmission for operating said output element of said output transmission through one of said input elements of said output transmission and one of said output elements of said summing transmission in a first position and for operating said output element of said output transmission through the other of said input elements of said output transmission and the other of said output elements of said summing transmission in a second position.

4,291,593
TORQUE REDUCTION UNIT HAVING SMALL BEVEL GEARS, PARTICULARLY FOR THE OPERATION OF ROLLING SHUTTERS

Vincenzo Santambrogio, Cernusco sul Naviglio, Italy, assignor to IMBAC S.p.A., Milan, Italy

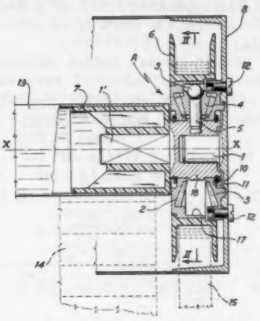
Filed Feb. 21, 1979, Ser. No. 13,480

Claims priority, application Italy, Dec. 20, 1978, 31057 A/78

Int. Cl.³ F16H *1/30, 1/20;* E06B *9/20*

U.S. Cl. 74—799 **2 Claims**

1. A compact torque reduction unit for rolling shutters or blinds comprising:
a stationary box;
a first crown gear fixed to said stationary box;
A pulley rotatable about an axis, said pulley including a radially outer circumferential surface adapted to guide a drive element;
a second crown gear fixed to said pulley;
at least three bevel gears engaged between said crown gears;
a central hub rotatable about said axis and fixed to a drum of said shutters or blinds;
a radial pin for each of said bevel gears, connected between said hub and a respective bevel gear; and



ball bearing means seated in a radially outer portion of each of said bevel gears and engageable with an axially extending bearing surface of said pulley,
whereby radial forces imparted upon said unit by said drive element are transmitted to said drum and said stationary box via said ball bearing.

4,291,594
METHOD OF VEHICLE ENGINE CONTROL

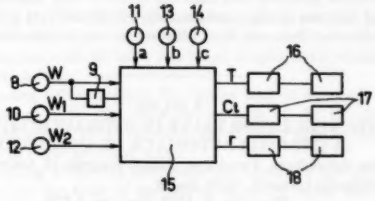
Patrice Baudoin, Bougival, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 31, 1978, Ser. No. 891,995

Claims priority, application France, Mar. 31, 1977, 77 09799

Int. Cl.³ B60K *41/14, 41/22, 41/24*

U.S. Cl. 74—857 **10 Claims**

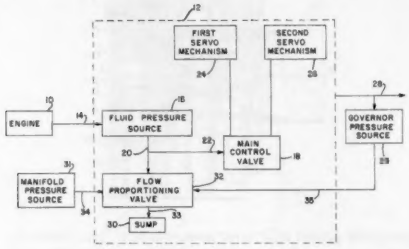


1. A method of regulation of a motor-drive unit for a motor vehicle which comprises a heat-engine and a transmission having a continuously variable transmission ratio, said method comprising:
during steady operation (a) controlling the heat-engine fuel feed as a function of the two variables which consist of (i) the displacement of the accelerator pedal of the vehicle and (ii) the speed of rotation of the heat-engine, to cause the power delivered by the heat-engine to be as near as possible to the power required which corresponds with the displacement of the accelerator pedal, and (b) controlling the transmission ratio to cause the speed of rotation of the heat-engine to tend to approach an ideal speed which depends upon said required power and is predetermined for operation of the motor- drive unit, which is optimalised in accordance with a chosen criterion; and
during transient operation (a) modifying the power delivered by the heat-engine as a function of the displacement of the accelerator pedal to be as near as possible to said required power, and (b) thereafter controlling the transmission ratio without changing the modified power so that said speed of rotation tends to approach said ideal speed.

4,291,595
GAS SAVING TRANSMISSION

Svetozar Jelaca, Los Angeles, Calif., assignor to George Luburich, Arlington Heights, Ill., a part interest

Continuation-in-part of Ser. No. 894,484, Apr. 10, 1978, abandoned. This application Feb. 2, 1979, Ser. No. 8,887
Int. Cl.³ B60K *41/16*
U.S. Cl. 74—863 **8 Claims**

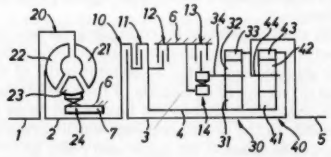


1. A control system for a transmission having an input shaft, an output shaft, a fluid pressure source driven by said input shaft, and a plurality of fluid pressure responsive servo members for determining the drive condition of the transmission, said control system including flow proportioning valve means disposed between said fluid pressure source and said servo members and in communication with a manifold pressure source and a sump, operative to vary the fluid flow from said fluid pressure source between said servo members and said sump in relation to said manifold pressure, said flow from said pressure source to said servo members increasing as manifold vacuum pressure decreases, and means for providing a governor pressure which varies directly with the rotational speed of said output shaft and means connecting said governor pressure to said flow proportioning valve means whereby, when said output shaft has reached a predetermined rotational speed, said governor pressure overrides the effect of said manifold vacuum pressure to allow substantially all of said fluid pressure to be directed from said fluid pressure source to said servo members.

4,291,596
FLOW REGULATOR VALVE IN HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Shiro Sakakibara, Toyokawa, Japan, assignor to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Jan. 5, 1979, Ser. No. 1,273
Claims priority, application Japan, Jan. 10, 1978, 53-1375
Int. Cl.³ B60K *41/06, 41/10*
U.S. Cl. 74—867 **4 Claims**



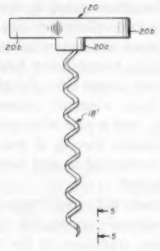
1. In a hydraulic control system for an automatic transmission having an input shaft adapted to be driven by an engine, an output shaft adapted to drive the vehicle, a change-speed gearing including low and high range frictional engagement mechanisms for respectively completing low and high speed ratio power trains between said input and output shafts, said hydraulic control system comprising a fluid reservoir, a source of line pressure, a first fluid passage in communication with said pressure source, a second fluid passage in communication with said low range frictional engagement mechanism, a third fluid passage in communication with said high range frictional engagement mechanism, a throttle valve connected to said pressure source for producing throttle pressure in accordance with depression of an accelerator pedal, a governor valve connected to said pressure source and driven by said output shaft for producing governor pressure in accordance with rotational speed of said output shaft, and a shift valve responsive to the governor pressure and the throttle pressure for respectively connecting said second and third fluid passages to said first fluid passage and said reservoir when the governor pressure is lower than the throttle pressure and for respectively connecting said second and third fluid passages to said reservoir and said first fluid passage when the governor pressure increases higher than the throttle pressure,

the improvement comprising a flow regulator valve disposed within said second fluid passage and responsive to the governor pressure via a fourth fluid passage connected between said governor valve and said regulator valve to control the flow of fluid from said pressure source to said low range frictional engagement mechanism in accordance with the governor pressure.

4,291,597
CORK EXTRACTOR

Herbert Allen, Houston, Tex., assignor to Hallen Company, Houston, Tex.

Continuation-in-part of Ser. No. 925,365, Jul. 17, 1978. This application Mar. 5, 1979, Ser. No. 17,598
Int. Cl.³ B67B *7/00*
U.S. Cl. 81—3.48 **7 Claims**

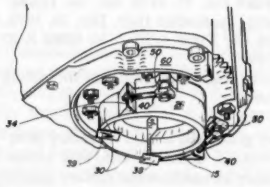


1. Cork extracting apparatus including a helical corkscrew comprising a central body and an outer layer of friction reducing polymeric material on at least a portion of the downwardly facing surfaces of said central body.

4,291,598
BRAKE APPARATUS FOR POWER WRENCH

Gary D. Cherry, Houma, La., assignor to Sladco, Inc., Eunice, La.

Filed Aug. 20, 1979, Ser. No. 67,887
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.15 **8 Claims**



1. A power tong brake apparatus comprising:

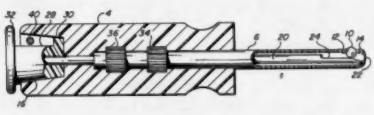
a. a power tong having a tong housing and at least an inner jaw carrier;
b. a brake body, said brake body being of rounded construction and having a throat portion which allows the entry of drill pipe, to be assembled or disassembled by the power tong, to be placed at the inner portion of said brake body, said brake body comprising:
  i. a generally circular flange having a plurality of attachment openings spaced about the periphery thereof, said flange being fittable against the jaw carrier portion of said power tong and being attached thereto during operation;
  ii. a cylindrical exposed brake drum projecting externally of said housing and providing a curved outwardly facing braking surface;
  iii. a generally circular transitional section connecting said mounting flange and said brake drum;
c. a plurality of threaded bolts inserted respectively through said plurality of openings in said mounting flange and connecting by threading into the lower end of said jaw carrier;
d. a brake shoe attached during operation to said power tong housing adjacent said brake surface, said brake shoe surrounding said body and providing a frictional lining surface facing inwardly which registers with and frictionally contacts during operation at least a portion of said brake body at said braking surface;
e. tensioner means associated with said brake shoe and said power tong housing for adjusting clearance between said brake shoe and said brake body.

4,291,599

KEY FOR DRIVING TAMPER-PROOF BOLT

John R. Heckrotte, Sr., Phoenix, Ariz., assignor to Morlock Corporation, Phoenix, Ariz.

Filed Dec. 10, 1979, Ser. No. 101,821
Int. Cl.³ B25B *15/00*
U.S. Cl. 81—444 **6 Claims**



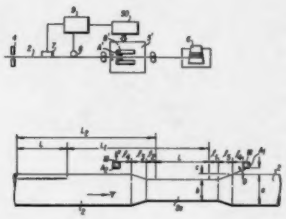
1. An improved key for driving tamper-proof bolts, the key including a tubular sleeve having a transverse aperture at a first end thereof, a plunger rod axially slidable within said tubular sleeve, said plunger rod having a camming surface at a first end thereof and having a longitudinal axis, ball means captively held by said tubular sleeve adjacent the transverse aperture, said ball means being cammed into the aperture in said tubular sleeve by the camming surface upon axial movement of said plunger rod, the improvement comprising:
  a. a key handle molded onto a second end of said tubular sleeve opposite the first end, the key handle having molded therein a chamber providing access to the second end of said tubular sleeve;
  b. a plunger handle molded onto a second end of said plunger rod opposite the camming surface, said plunger handle being axially slidable within the chamber of said key handle for axially sliding said plunger rod within said tubular sleeve, said plunger handle having molded thereon a flattened surface parallel to the longitudinal axis of said plunger rod, said plunger handle also having molded thereon a flange adjacent an edge of the flattened surface nearest the first end of said plunger rod, the flange projecting away from said plunger rod beyond the flattened surface; and
  c. retaining means inserted into said key handle and extending transversely through the chamber parallel to the flattened surface of said plunger handle, said retaining means being disposed adjacent the flattened surface of said plunger handle for preventing said plunger handle from rotating within the chamber of said key handle and for retaining the flange of said plunger handle within the chamber of said key handle.

4,291,600

PROCESS AND APPARATUS FOR CUTTING CIRCUMFERENTIAL SURFACE TO REMOVE ROD SURFACE FLAWS

Yosiyuki Kawaguchi, Ashiya; Takashi Nishida, Nishinomiya; Nobuaki Marukawa, Toyonaka; Tadakazu Tanaka, Kobe, and Yoshinari Kontani, Shinminato, all of Japan, assignors to Kobe Steel, Limited, Kobe and Nippon Koshuha Steel Co., Ltd., Tokyo, both of, Japan

Filed Feb. 6, 1979, Ser. No. 9,914
Int. Cl.³ B23B *1/00, 5/12*
U.S. Cl. 82—1 C **5 Claims**



1. A process for controlling cutting of a surface flaw of a wire material or a rod-like material to be machined by a cutting tool which comprises:
  feeding the material to be machined;
  detecting the travelling speed and the surface flaw position of the material to be machined and transmitting corresponding signals;
  setting a depth of cut to be applied to the cutting tool in accordance with a flaw depth signal of the detecting signals;
  rotating the cutting tool about the axis of the material to be machined;
  feeding the material to be machined longitudinally past the cutting tool;
  advancing and retracting the cutting tool so as to cut the material to be machined on the basis of the travelling speed signal, a flaw position signal and a predetermined cut-in angle set value signal
  controlling advancing and retracting speeds of the cutting tool on the basis of the travelling speed signal and the predetermined cut-in angle set value; and
  actuating and controlling a tool driving device on the basis of the results of these operations.

3. An apparatus for cutting a surface flaw of a wire material or a rod-like material to be machined comprising:
  means for feeding the material to be machined;
  means for detecting the position and depth of the flaw and for generating position and flaw depth detection signals;
  means for detecting the travelling speed of the material to be machined;
  cutting means;
  means for advancing and retracting said cutting means only to the outer circumference of the surface flaw position of the material to be machined in a radial direction;
  means for rotating the cutting means about the longitudinal axis of the material to be machined;
  said means for feeding the material to be machined further comprising means for feeding the material to be machined longitudinally past the cutting means;
  means for setting the depth of cut to be applied to said cutting means in accordance with the flaw depth signal;
  said means for advancing and retracting said cutting means further comprising means for advancing and retracting said cutting means on the basis of the travelling speed of

the material to be machined, the flaw position signal and a predetermined cut-in angle set value signal for said cutting means that is set in advance

means for operating the speed of advancing and retracting of said cutting means on the basis of said travelling speed signal and said predetermined cut-in angle set value signal of said cutting means; and

control means for driving said cutting means on the basis of the results of said operations.

4,291,601

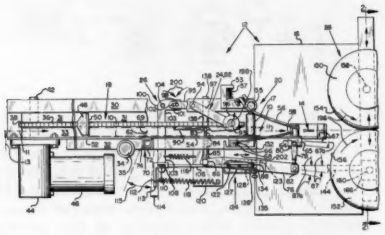
SHAKE RESAW FEED SYSTEM

William J. Guynup, 3106 NW. Harrison, Corvallis, Oreg. 97330

Filed Sep. 10, 1979, Ser. No. 74,056

Int. Cl.³ B27M *3/02*

U.S. Cl. 83—415 **20 Claims**



1. A shake resaw feed system for use with a band saw for sawing tapered shake shingles from slabs, said system comprising:

conveyor means for conveying a slab lengthwise toward and through the blade of said saw; and

guide means for positioning said slab for cutting said slab lengthwise along a cutting line between its broad faces;

said guide means including wall means extending lengthwise along the conveyor means and said wall means being immobile relative to the conveyor means in a lengthwise direction,

a portion of the wall means being laterally movable for progressively shifting said slab laterally of said conveyor means so that the blade begins cutting at an end face of said slab at a lateral position near one of said broad faces and finishes cutting at the opposite end face at a lateral position near the opposite broad face.

4,291,602

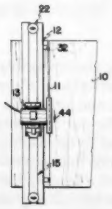
PANEL CUTTING DEVICE

John Fast, and Harvey Williams, both of Winnipeg, Canada, assignors to Educase Incorporated, Winnipeg, Canada

Filed Feb. 25, 1980, Ser. No. 123,987

Int. Cl.³ B27B *9/04*

U.S. Cl. 83—745 **10 Claims**



1. A panel cutter assembly for use with a power saw comprising in combination a longitudinally extending guide member, means to detachably clamp said guide member to the panel being cut, a panel cutting saw component, means detachably engaging and guiding said saw component for longitudinal movement along said guide member and means extending from one side of said guide member engaging the line to be cut on said panel, said means detachably engaging and guiding said saw component including a longitudinally extending slot formed in the upper surface of said guide member and means extending from said panel cutting saw component slidably engaging said slot, said slot being in the form of a mortise slot having a relatively narrow upper portion opening onto the upper surface of said guide member and a pair of horizontally situated wing slots extending one upon each side of the base of said upper portion and communicating therewith to present an inverted T formation when viewed in end elevation.

4,291,603

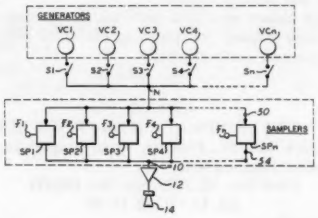
ELECTRONIC ORGAN

Bernard R. Katz, 21 Woodside Dr., Rockaway, N.J. 07886

Filed Nov. 29, 1978, Ser. No. 964,704

Int. Cl.³ G10H *1/00;* **H04M** *1/00*

U.S. Cl. 84—1.01 **25 Claims**



1. A tone generating system of an electronic organ for producing a plurality of notes each having a frequency corresponding to a different note on a musical scale, comprising:

a plurality of voice signal generators, each producing a supersonic signal having a different waveshape;

a manually operable main selection means for combining selected ones of said plurality of voice signal generators to produce a main signal;

a plurality of key signal generators producing a plurality of key signals, each of said plurality of notes corresponding to and having a predetermined frequency relation with a different one of said plurality of key signals, the interfrequency spacing between adjacent ones of said plurality of notes being less than one octave, said plurality of notes having frequencies spanning more than an octave;

a plurality of main sampling means each operable to repetitively sample said main signal in response to a corresponding one of said plurality of key signal generators, said plurality of main sampling means operable to produce a plurality of main sampled signals, different ones of said plurality of main sampling means being operable to produce octavely related notes, said plurality of main sampling means comprises a plurality of switch devices having commonly coupled input terminals;

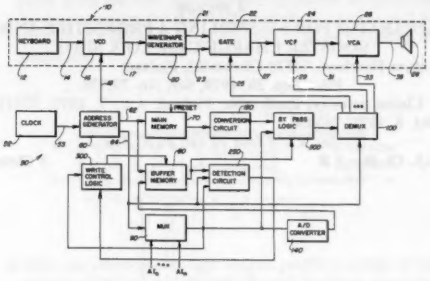
main output means for combining audio frequency components contained in said plurality of main sampled signals; and

manually playable main keyboard means for actuating said tone generating system, said main keyboard means operable to provide to said main output means any combination of said plurality of main sampled signals to produce said plurality of notes, said plurality of switch devices having output terminals coupled to said main keyboard means, said main keyboard means being operable upon said switch devices to produce the effect of coupling selected ones of said output terminals together and to said main output means.

4,291,604
MEMORY OVERRIDE SYSTEM FOR PROGRAMMED ELECTRONIC SYNTHESIZER

James L. Scott, Jacksonville, and David A. Luce, Clarence Center, both of N.Y., assignors to Norlin Industries, Inc., Deerfield, Ill.

Filed Aug. 1, 1979, Ser. No. 62,562
Int. Cl.³ G10H *1/12, 1/46*
U.S. Cl. 84—1.19 **19 Claims**



1. In a programmable electronic musical instrument having a plurality of parameter circuits each normally controlled in response to a stored parameter signal for producing a programmed timbre of sound, a memory override system comprising:

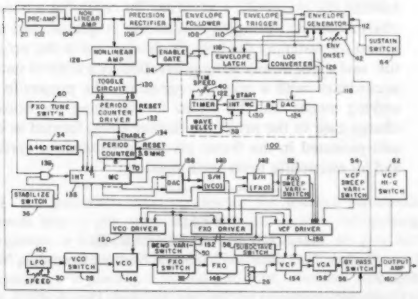
a plurality of manually adjustable input signal sources each developing an input signal capable of controlling only a respective one of said parameter circuits; and

control means responsive to manual adjustment of each of said input signal sources for causing the input signal associated with an adjusted signal source to control its respective parameter circuit in lieu of the corresponding stored parameter signal, the remaining parameter circuits being controlled in response to their respective stored parameter signals.

4,291,605
MUSIC SYNTHESIZER

Donald L. Tavel, 233 W. Westfield Blvd., Indianapolis, Ind. 46208, and Michael L. Beigel, Warwick, N.Y., assignors to Donald L. Tavel, Indianapolis, Ind.

Filed Jun. 7, 1979, Ser. No. 46,437
Int. Cl.³ G10H *1/057*
U.S. Cl. 84—1.26 **13 Claims**



1. In a music synthesizer having means for receiving an input signal defining a musical sound, said sound having an amplitude which initially increases to a maximum value and thereafter decreases, said synthesizer further having means for processing said input signal to provide an envelope signal of the amplitude of said input signal, the improvement comprising:

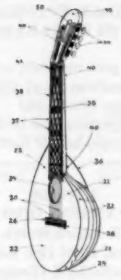
means for storing a value manifesting the maximum attained amplitude of said envelope signal; and

means responsive to said stored value for providing a synthesized output signal having an amplitude related to said stored value.

4,291,606
MUSICAL STRING INSTRUMENT

Raymond Lepage, 2580 Sheppard St., Montreal, Canada (H2K 3L2)

Continuation-in-part of Ser. No. 29,444, Apr. 12, 1979, abandoned. This application Apr. 28, 1980, Ser. No. 144,079
Int. Cl.³ G10D *3/00*
U.S. Cl. 84—291 **7 Claims**



1. A musical string instrument comprising a body shell of generally ovoid shape and formed of a plurality of ribs of varying shapes depending on which side of said shell they are located; a flat sound board of generally oval shape secured to the top of said shell and provided with a sound hole; a tail block secured to the remote end of said shell, the corresponding ends of all said ribs being secured to said tail block; a plurality of braces secured to the underside of said sound board and radiating from said tail block; at least one transverse brace secured across the widest portion of said shell; further comprising a neck wide enough to accommodate eight strings, a fretted finger board secured to the top surface of said neck, said finger board being provided with positive note identification means; a peghead secured to said neck; two slots being provided in said peghead, each said slot having rollers for four strings; tuning pegs to operate said rollers in a known manner; a spine securing said neck to said body shell wherein said spine extends from said neck downwardly and curvedly to the central bottom portion of said body shell; said sound board being further provided with a bridge having a saddle for said strings.

4,291,607
FLOATING BRIDGE FOR STRING INSTRUMENTS

Clayton O. Kauffman, Santa Ana, Calif., assignor to James Ketchum, Anaheim, Calif.

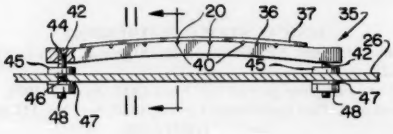
Filed Jun. 6, 1980, Ser. No. 157,236
Int. Cl.³ G10D *3/04*
U.S. Cl. 84—299 **8 Claims**

1. A floating-bridge device for string instruments and combined therewith to generate a high volume of responsive resonated sound from the hollow body of the instrument, said device comprising:

a bridge block attached to the strings under tension defined by an elongated member having a longitudinal channel formed therein, and a plurality of transversely disposed grooves adapted to correspond to and receive said strings therein;

a clamping means secured to said bridge block, whereby said strings are clamped therebetween;

wherein said clamping means comprises at least one clamping bar to fit within said channel of said bridge block, said clamping bar being secured thereto to clamp said strings between said clamping bar and said block, whereby said floating-bridge device transmits the vibration from said strings to said soundboard, without interference from the longitudinal tension of said strings;



means for mounting said bridge block to the flexible soundboard of said hollow body of said instrument, wherein vertical tension of the strings is prevented, said mounting means comprising:

at least one vertical post member, one end of which is attached to said soundboard and the opposite end is connected to said bridge block; and

means thereon for adjusting said bridge block in a vertical direction, whereby said bridge block engages said strings.

4,291,608

EXPANSION DOWEL

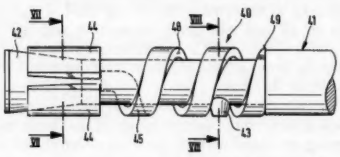
Gusztav Lang, Munich; Friedrich Storck, Hersbruck, and Hans-Dieter Seghezzi, Vaduz, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Dec. 26, 1978, Ser. No. 973,029

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1977, 2758374

Int. Cl.³ F16B *13/06*

U.S. Cl. 411—16 **4 Claims**



1. Expansion dowel to be inserted into a borehole or the like with the dowel having a leading end which is first inserted into a borehole and a trailing end, comprising an axially elongated dowel body having a leading end and a trailing end, said dowel body including an axially extending spreading member located at the leading end thereof and said spreading member having a dimension in the direction transverse to the axial direction which decreases in the direction from the leading end toward the trailing end, an expansion member extending laterally around said dowel body from said spreading member toward the trailing end thereof, said expansion member being radially expandable when said separating member is pulled axially through said expansion member, wherein the improvement comprises that said expansion member has a control cam surface extending helically around at least an angular portion of the circumference of said dowel body and said control cam surface faces toward the trailing end of said dowel body, a stop formed on and extending outwardly from the circumferential surface of said dowel body spaced axially from said spreading member, said stop disposed in contact with said control cam surface and said dowel body being turnable about its axis so that said stop rides along said control cam surface and provides relative movement between said spreading member and said expansion member pulling said spreading member onto said expansion member and causing said expansion member to expand radially outwardly, said expansion member comprises a plural-part sleeve-like section extending from said spreading member toward the trailing end of said dowel body, and a helically extending strip wound about said dowel body and extending from the end of said sleeve-like section which is more remote from said spreading member toward the trailing end of said dowel body.

4,291,609

APPARATUS FOR ASSEMBLING A PROJECTILE AND A BOOSTER CHARGE CASE TO A SHOT

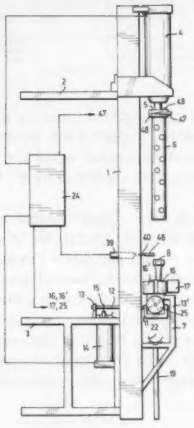
Antero Iivarinen, 74520 Ohenmäki, Finland

Filed Sep. 28, 1979, Ser. No. 79,738

Claims priority, application Finland, Apr. 7, 1977, 771117; Oct. 6, 1978, 783050

Int. Cl.³ C06B *21/00;* **F42C** *33/02*

U.S. Cl. 86—1 R **8 Claims**



1. Apparatus for assembling a projectile of artillery calibre and a booster charge to a shot, comprising, a frame structure and mounted thereon,

means for receiving and holding a projectile,

means for receiving a booster charge case and bringing it onto the projectile to a fastening position,

means for fastening the booster charge case to the projectile,

pneumatically and/or hydralically operated drive means being provided for actuating said means for receiving and holding the projectile, said means for receiving a booster charge case and bringing it onto the projectile, and said means for fastening the booster charge case to the projectile, said drive means being controlled by a control unit in accordance with a preset programme, the projectile receiving means and the means for fastening the booster charge case to the projectile further being formed as one unit mounted in the frame pivotably between a vertical and an essentially horizontal position.

4,291,610

SILENCER FOR FIREARMS

Shimon Waiser, P.O. Box 360 Midwood Station, Brooklyn, N.Y. 11230

Continuation-in-part of Ser. No. 857,464, Dec. 5, 1977, abandoned. This application Apr. 19, 1979, Ser. No. 24,474

Int. Cl.³ F41L *21/18*

U.S. Cl. 89—14 D **7 Claims**

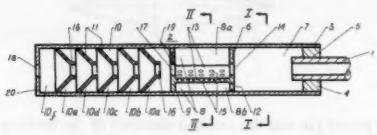
1. A silencer for mounting on the barrel of a hand weapon comprising:

a casing having its rear part in communication with the barrel of the hand weapon,

said casing having an apertured front end wall with said aperture therein for the exit of the projectile and discharged gases,

at least three chambers axially aligned in said casing, the first chamber of said chambers following the barrel of the hand weapon for expanding of the discharged gases,

the second chamber of said chambers being to decrease discharged gases energy and movement and being separated from the first and the third chambers by partitions having openings for the passage of the projectile and for forming the main stream of discharged gases following the projectile,



at least one additional trough shaped partition inside of said second chamber said trough shaped partition extending across the interior circumference of said casing and said trough shaped partition having openings therein,

said trough shaped partition dividing said second chamber into sub-chambers at least one of which is for forming auxiliary streams of discharged gases and guiding said auxiliary streams of discharged gases through said openings into the main stream of discharged gases,

said openings in said trough shaped partition inside of said second chamber having axes directed to said main stream of discharged gases,

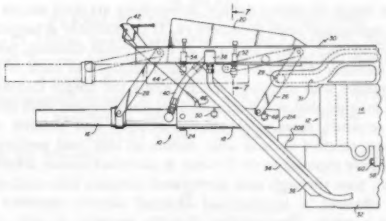
the third chamber of said chambers comprising additional partitions for dispersing sound waves and supplementary decreasing the discharged gases energy and movement.

4,291,611

AUTOMATIC LOADING DEVICE

Warren W. Wells, Radcliffe, Ky.; Robert E. Strohman, East Moline, Ill., and Harold H. Wiese, Davenport, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 18, 1979, Ser. No. 86,235
Int. Cl.³ F41F *9/10*
U.S. Cl. 89—47 **8 Claims**



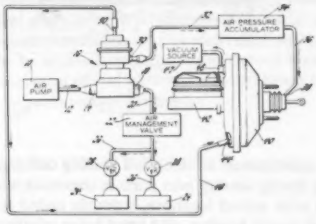
1. An automatic loading device for loading ammunition rounds into a gun tube chamber, said device comprising a magazine, a tray-rammer assembly responsive to gun recoil and counter recoil forces for removing a round from said magazine and placing it in said gun tube chamber, said assembly including a loading tray and a rammer mechanism, said rammer mechanism moving said round from said tray into said chamber, said loading tray being moved to a round receiving position under said magazine upon gun recoil and moved to a round chambering position upon gun counter recoil, said gun tube being supported by a gun carriage and said tray being suspended by links from said gun carriage, a cam follower mounted on said links and a cam track mounted on and moving with said gun tube, said cam follower being positioned in said cam track whereby recoil of said gun tube moves said tray into said round receiving position and counter recoil of said gun tube moves said tray into said round chambering position.

4,291,612

POWER BRAKE SYSTEM DIFFERENTIAL AIR PRESSURE CONTROL VALVE ASSEMBLY

Edward G. Day, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 25, 1979, Ser. No. 51,817
Int. Cl.³ F01B *21/02*
U.S. Cl. 91—6 **2 Claims**



1. In a power brake system having a brake booster operable by differential air pressure provided by a source of vacuum and a source of compressed air pressure, a differential air pressure control valve assembly maintaining a substantially constant available differential of air pressure between the vacuum and the compressed air pressures available to the brake booster for booster power operation, said control valve assembly comprising:

a housing having first, second and third chambers respectively having therein compressed air pressure from said source, compressed air pressure for booster operation and vacuum for booster operation; a movable power wall defining a common wall between said second and third chambers, valve port means connecting said first and second chambers, and valve means responsive to movements of said movable power wall in response to changing pressure differentials thereacross for controlling the compressed air pressure in said second chamber to maintain a substantially constant pressure differential across said power wall and thus establish a substantially constant available differential of air pressure to the brake booster for booster power operation, said valve means accomplishing said controlling by selectively holding compressed air pressure in said second chamber when the pressure differential across said power wall is at the desired substantially constant pressure differential, and either admitting compressed air from said first chamber through said valve port means to said second chamber when the pressure differential across the said power wall is less than the desired substantially constant pressure differential, or discharging compressed air from said second chamber to atmosphere when the pressure differential across said power wall is greater than the desired substantially constant pressure differential, so as to reestablish and maintain said desired substantially constant pressure differential.

4,291,613

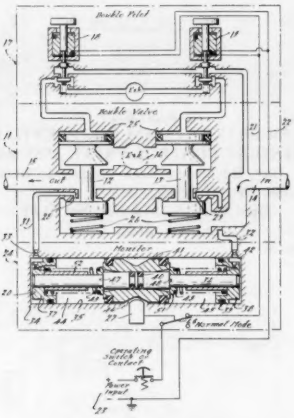
MONITOR FOR DOUBLE SAFETY VALVES

Edward B. Porter, Pontiac, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.

Filed Feb. 23, 1979, Ser. No. 14,642

Int. Cl.³ F01B *31/12, 25/26*

U.S. Cl. 92—131 **7 Claims**



1. In combination, an elongated housing defining a bore, said housing having sensing inlet ports in communication with said bore at axial spaced locations, a double ended spool slidably mounted in said housing, said spool being relatively short and forming with said bore opposite sensing chambers, each of said sensing inlet ports being in communication with a respective of said sensing chambers, a shaft extending axially through said bore from one end to the other and passing through said spool, end plugs within said bore supporting the opposite ends of said shaft, restricted passages in said end plugs leading from the sensing inlet ports in said housing to said sensing chambers, a pair of helical coil compression springs disposed between said end plugs and said spool, and means capturing the inner ends of said springs whereby said spool when moved in either direction to compress one of said springs will not be followed by the end of the other spring.

4,291,614

PISTON AND PROCESS FOR ITS MANUFACTURE

Egon Mölle, Oberasbach, and Fritz Rösch, Schwabach, both of Fed. Rep. of Germany, assignors to Alcan Aluminiumwerk Nürnberg GmbH, Nuremberg, Fed. Rep. of Germany

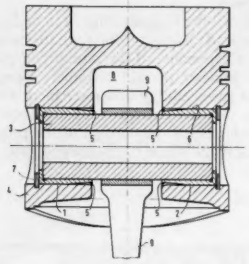
Filed Jun. 25, 1979, Ser. No. 51,360

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1978, 2828402

Int. Cl.³ F16J *1/18*

U.S. Cl. 92—187 **10 Claims**

1. A piston, in particular for internal combustion engines, having a piston pin bore receiving an essentially rigid, cylindrical piston pin which serves to secure a piston rod, wherein between the pin and the bore, at or near the two ends of the pin, cylindrical bushings are provided which float rotatably in the piston pin bore, and means are provided for preventing axial displacement of the bushings beyond the ends of the pin, characterized in that the bushings are disposed floatingly on



the piston pin and the external diameter of the bushings diminishes towards the axis of the piston.

4,291,615

LINEAR AIR OUTLET

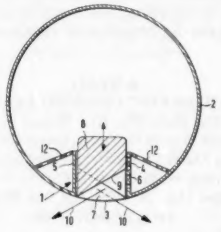
Frank Sodec, Wuerselen-Broichweiden, Fed. Rep. of Germany, assignor to Firma H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Sep. 27, 1979, Ser. No. 79,540

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 7828982[U]

Int. Cl.³ F24F *13/06*

U.S. Cl. 98—40 C **7 Claims**



1. A linear air outlet device, comprising art duct means (**2**), two longitudinal wall members (**4**, **5**) operatively arranged in parallel to each other to form an open guide channel, perforated sections (**6**) and non-perforated sections in each of said longitudinal wall members spaced along the length thereof in such a manner that non-perforated sections register with perforated sections, means operatively locating said parallel wall members relative to said duct means so that said perforated sections are exposed to air flowing in said duct means, whereby air may pass through said perforated sections into said open guide channel, a longitudinal channel closure member (**8**) having a prism cross-section slidably inserted in said open guide channel for displacement perpendicularly to the longitudinal axis of said open guide channel, said channel closure member (**8**) having air deflection surface means (**9**) slanting alternately in opposite directions so that the deflection surface means face a respective perforated section in said wall members, said channel closure member further having parallel surface means slidably fitting into said guide channel between said parallel wall members of said guide channel, said parallel surface means of said closure member performing a dual function by cooperating in the guiding of the sliding movement of said closure member inside said guide channel and by exposing a variable portion of said perforated sections to the passage of

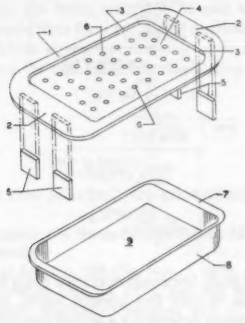
air therethrough, said slanting surface means guiding said air substantially in opposite directions out of said open guide channel.

4,291,616

ROASTER TRAY

Alexander P. Taylor, 3108 Fairview Ave., Parkersburg, W. Va. 26101

Filed May 14, 1979, Ser. No. 38,803
Int. Cl.³ A47J *27/00*
U.S. Cl. 99—446 **1 Claim**



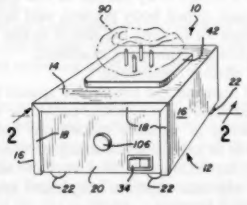
1. A utensil adapted for use in both the cooking and serving of meats or other foods comprising a lower supporting vessel and an upper tray which is adapted to sit on top of said vessel, said tray including a perforated food surface equal in area to the vessel on which it rests, the tray further including protruding side and end portions which extend over and overlap upper edges of said vessel, said tray including sidewalls between said perforated surface and said portions so as to form a food holding cavity, the tray end portions further including downwardly extending support protrusions which extend down and closely adjacent the outside of the vessel walls when food is being cooked and which function as support legs therefor when removed from the vessel, the protrusions extending well within the confines of said tray portions and closely adjacent said vessel outside walls so as to prevent lateral movement of the tray when positioned on top of said vessel.

4,291,617

PRESSURIZED INJECTION STEAMER

Dye O. Miller, South Barrington; August J. Antunes, Elmhurst, and Jerome Antunes, Clarendon Hills, all of Ill., assignors to A. J. Antunes & Co., Addison, Ill.

Continuation-in-part of Ser. No. 899,164, Apr. 24, 1978. This application Aug. 28, 1979, Ser. No. 70,484
Int. Cl.³ A23L *3/16*; A47J *27/04*
U.S. Cl. 99—483 **2 Claims**



1. An injection steamer for heating food items or the like, comprising:

a steam generating chamber comprising a lower housing portion and an upper cover plate;

means for heating an area of said steam generating chamber;

water inlet means mounted in a steam chamber above the heated area for introducing water from a source thereof, said water inlet being manufactured of a material having a low heat transfer coefficient;

means for removably mounting the upper cover plate to said steam generating chamber lower housing portion;

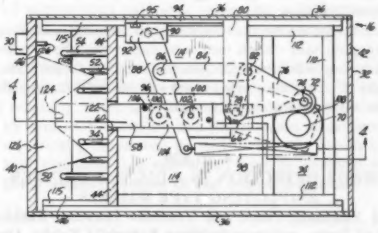
a plurality of injector needles mounted in fluid communication with said steam chamber for supplying said pressurized steam to the interior of a food item, a baffle plate mounted between said water inlet means and said injection needles, said means for removably mounting said cover plate to the steam generating housing lower portion comprises a bayonet mount wherein said bayonet mount is operable by relative rotation of said cover plate to said lower housing portion, and interlock means to prevent steam generation when said cover plate is not securely locked to the lower housing portion, said interlock comprises cam actuated switch means connected to said water inlet tube to prevent the introduction of water into said steam chamber, said switch means actuated by rotation of said cover plate relative to said lower housing portion wherein said switch means is mounted below said bayonet mount to be actuated by engagement thereof upon complete securement of said cover plate to said lower housing portion to permit steam generation.

4,291,618

METHOD AND APPARATUS FOR FOLDING AND CRUSHING EMPTY CYLINDRICAL CANS

Warren R. Heiser, 934 N. Mildred St., Dearborn, Mich. 48128, and Eugene A. Acey, Davisburg, Mich., assignors to Warren R. Heiser, Dearborn, Mich.

Filed Oct. 5, 1979, Ser. No. 82,142
Int. Cl.³ B30B *1/04, 9/32*
U.S. Cl. 100—35 **23 Claims**

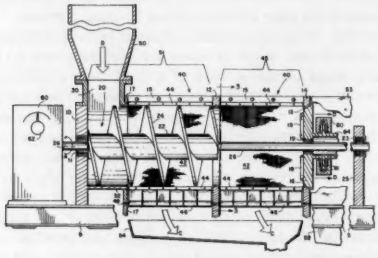


1. A method for serially folding and flattening empty cylindrical cans each having a cylindrical sidewall and two circular end faces, said method comprising the steps of supporting one of said cans in a folding station between a flat stationary anvil and a flat reciprocable platen with the longitudinal axis of said can parallel to said anvil and said reciprocable platen, advancing a reciprocable creasing element through an aperture in said platen into the center of the cylindrical sidewall of said can and simultaneously advancing said platen towards said can until said creasing element has pressed the center portions of the opposite sides of said cylindrical sidewall into contact, rapidly retracting said creasing element from said can while continuing to advance said platen until the can circular end faces are substantially coplanar, and retracting said platen.

4,291,619
SCREW PRESS WITH CONTROLLABLE REAR DOOR

Arthur J. Hunt, and Arthur J. Hunt, Jr., both of 332 N. Halifax Dr., Orlando, Fla. 32704

Filed Oct. 17, 1979, Ser. No. 85,492
Int. Cl.³ B30B *9/12*
U.S. Cl. 100—43 **4 Claims**



1. In a screw press for extracting liquids from materials such as fruits, vegetables, or the like having a frame, a cylindrical feed chamber and pressing chamber, said pressing chamber having screen walls for passing extracted liquids therethrough, a rotating drive shaft extending through and concentric with said chambers, and a helical feed and compression screw concentric with said shaft and disposed ahead of said compression chamber for compressing said materials against said screen walls of said chamber, the improvement comprising:

a circular door disposed at the outlet end of said cylindrical pressing chamber for closing said chamber prior to a pressing operation, said circular door slidably engaged with said drive shaft;

controllable pressure-producing means externally connected to said circular door for maintaining said door in a closed condition until outward pressure from inside said pressing chamber exceeds a preselected external pressure from said pressure-producing means;

cutter bars attached to the inside surface of said circular door;

electrically operated clutch means connected to the outside surface of said door and to said rotating drive shaft, said clutch means being disengaged when said door is in its closed position; and

clutch operating means responsive to opening said door for engaging said clutch means to cause said shaft to rotate said door wherein said cutter bars rotate to pare away a cake of dried materials forced out of said pressing chamber when said door is opened.

4,291,620
ERROR DETECTION IN A DIGITAL PRINTER EMPLOYING TYPE WHEELS

Hitoshi Yamasaki, Nara, and Yasutaka Iwawaki, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 25, 1979, Ser. No. 78,727
Claims priority, application Japan, Sep. 27, 1978, 53-119810
Int. Cl.³ B41J *1/44*
U.S. Cl. 101—99 **7 Claims**

1. A printer comprising:

at least one print wheel on which a plurality of types are mounted;

a wheel shaft for rotatably supporting said print wheel;

drive means for rotating said wheel shaft;

timing signal generation means for developing timing signals in response to rotation of said wheel shaft, said timing signals comprising:

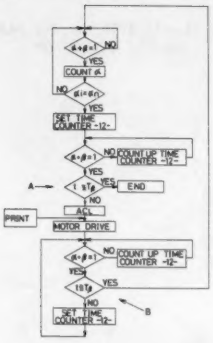
type selection controlling signals having time interval corresponding to a space provided between two adjacent types mounted on said print wheel; and

a wheel round detection signal for indicating a complete one round of said wheel shaft; and

a print control system comprising:

first detection means for detecting occurrence of said wheel round detection signal to develop a first control signal;

first counter means for counting said type selection controlling signals, the count operation being initiated upon generation of said first control signal, and said first counter means developing a second control signal when said type selection controlling signals are counted by a predetermined number; and

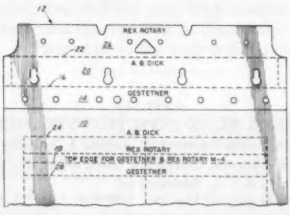


second detection means for determining whether said wheel round detection signal is developed next after development of said second control signal.

4,291,621
ADAPTABLE STENCIL FOR DIFFERENT MIMEOGRAPH MACHINES

Charles F. Thomas, 2000 Skyrock Rd., Loveland, Colo. 80537

Filed Sep. 25, 1978, Ser. No. 945,482
Int. Cl.³ B41F *15/00*; B41L *13/00*
U.S. Cl. 101—114 **4 Claims**



1. A mimeograph stencil having an elongated heading portion secured to a stencil body portion at one end of a lengthwise extent of said stencil body portion, said heading portion providing a means for holding the stencil in one of a plurality of different brands of duplicating machines,

said heading portion comprising:

a plurality of separate and lengthwise spaced lines of laterally aligned holding pin holes, each line comprising a different series of laterally spaced pin holes sized and positioned so as to hold said heading portion in a different one of said duplicating machines, each of said spaced lines formed in adjacent, separate lengthwise spaced areas of said elongated heading,

tear line means for removing a part of said heading portion from the remainder of said heading portion secured to said stencil body, said tear line means comprising a single

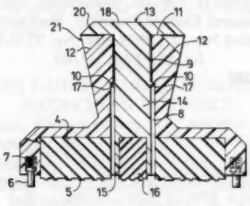
perforated tear line extending laterally across said heading portion and between each of said adjacent, separate lengthwise spaced areas, permitting one or more of said spaced, pin hole lines to be tearingly removed from said stencil, and a series of stencil cutting guide lines positioned on said stencil body portion for defining boundaries within which the written matter should be imprinted on the stencil body, said heading portion and stencil body having markings which designate a respective certain one of said series of stencil cutting guide lines to be utilized for a given respective line of holding pin holes whereby said stencil cutting guide lines coordinate each particular line of holding pin holes with one of said series of stencil cutting guide lines for a particular duplicating machine so as to provide correct positioning of written matter on print paper for that particular duplicating machine.

4,291,622

HAND STAMP HAVING AN ADJUSTABLE STAMP PRINT

Algot E. Bengtsson, c/o Boras Stampelfabrik AB Box 17, 501 02 Boras 1,, Sweden

Continuation of Ser. No. 958,474, Nov. 7, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,637
Claims priority, application Sweden, Nov. 11, 1977, 7712758
Int. Cl.³ B41K *1/08*
U.S. Cl. 101—368 **3 Claims**



1. A date indicating hand stamp, for ink printing, comprising:

(i) a stamp body having therein one single opening of rectangular section, said opening extending from a first face to a second face;

(ii) a plurality of stamping units each including a stem portion adapted to pass into said opening and to extend from said first face to said second face, each of said stamping units having one surface thereof in contact with a corresponding surface of a neighbouring stamping unit, a head on each of said stems to abut on said first face in a fully inserted condition of the stem, and a printing member on each of said stems and having a printing face which in said fully inserted condition is in a common plane with said second face,

(iii) cooperating formations respectively on said stamp body and on each of said stems serving as latching means to retain said stamping units releasably in said fully inserted condition,

(iv) said stamp body being bevelled adjacent said first face such that, with said stamping units in said fully inserted condition, recessing is defined between the bevelled portion of the body and the head of the stamping units to receive the fingers to facilitate removal of the stamping units from the stamp body,

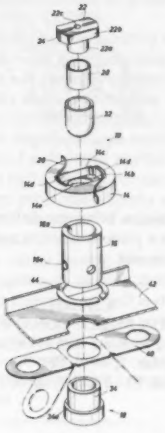
(v) said stamp body further having side portions projecting from said first face shaped to align with an outer surface of the heads of the stamping units.

4,291,623

BINARY ELECTROEXPLOSIVE DEVICE AND METHOD OF ASSEMBLY THEREOF

Ralph L. Robinson, Kingwood, and David D. Parrish, Spring, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,505
Int. Cl.³ E21B *43/263;* F42C *19/12*
U.S. Cl. 102—310 **39 Claims**



1. Electroexplosive apparatus comprising:

(a) first explosive means including first explosive material and electrical firing means, including electrical lead means, for igniting said first explosive means in response to an electrical signal received by said firing means;

(b) second explosive means, including second explosive material;

(c) housing means for holding said second explosive means;

(d) socket means for selectively receiving said first explosive means, said socket means being so positioned relative to said second explosive means when said second explosive means is held by said housing means that said first explosive means is automatically positioned to permit initiation of said second explosive means by said first explosive means when said first explosive means is so received by said socket means;

(e) electrical conductor means, as part of said socket means, for receiving such electrical signal; and

(f) whereby, when said first explosive means is so received by said socket means, said firing means is automatically electrically connected to said conductor means by said lead means so that said signal may be received by said firing means by means of said conductor means.

4,291,624

EXPLOSIVE CHARGES

Udo Sabranski, Willich, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 876,837, Feb. 10, 1978, abandoned. This application Jul. 26, 1979, Ser. No. 60,888
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2706060
Int. Cl.³ F42B *1/02*
U.S. Cl. 102—307 **6 Claims**

1. An explosive charge comprising:

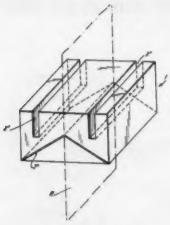
a casing,

a detonator mounted on top of the casing,

explosive material disposed within the casing and forming a hollow charge,

air cavity means being equidistantly positioned with respect to a reference line which is being selected from the group

of reference lines consisting of an axis of rotation or a line forming the intersection of two planes of symmetry, so that the shock wave produced by detonation is formed in a predetermined direction,



said air cavity means being quadrilateral in cross-section with respect to a plane containing said reference line and said air cavity means.

4,291,625

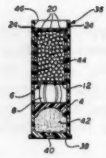
SHOT GUN SHELL CONSTRUCTION

George A. Stagg, Jr., 35 Kime Ave., Wayne, N.J. 07470

Filed Mar. 2, 1979, Ser. No. 16,842

Int. Cl.³ F42B *7/00, 9/16*

U.S. Cl. 102—449 **9 Claims**



1. A shot gun shell assembly which comprises:

a shot shell casing having a closed primer and an open shot loading end, and

a wad for insertion in said open end comprising a generally cylindrical shot cup defining a side wall and a base plate attached at one end thereof, said side wall longitudinally slotted to define a plurality of curved petals, said petals are connected at the free ends thereof to a pivotal closure structure which is adapted to retain all of the shot pellets within said shot cup when said wad is fully loaded therewith and inserted within said shot shell casing,

said closure structure comprising wedge-shaped flaps hingably attached to each of said petals at said free ends, said flaps having a wedge-shaped cross section defined by a first broader portion proximal to said free end, and a second narrower portion distal thereto, said broader portion terminating in a peripheral edge and an adjacent camming surface, said camming surface adapted to cooperate with the inner surface of said shot shell casing to urge said flap into a plane transverse to the axis of said wad, to retain said shot pellets within said shot cup.

4,291,626

ASSEMBLY OF PIEZOELECTRIC ELEMENT UNIT AND SHEET METAL MOUNT FOR IGNITION DEVICE

Kazumi Nakahara, Nagoya, Japan, assignor to NGK Spark Plug Co. Ltd., Nagoya, Japan

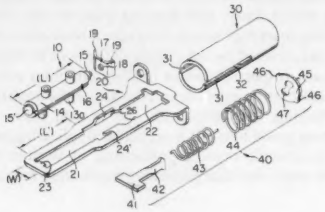
Filed Apr. 4, 1979, Ser. No. 26,890

Claims priority, application Japan, Apr. 7, 1978, 53-46404[U]

Int. Cl.³ F42C *11/02*

U.S. Cl. 102—200 **3 Claims**

1. A piezoelectric element unit and a sheet metal mount comprising: a cylindrical piezoelectric unit having first and second opposite grooves each axially extending on the circumferential surface thereof; said first and second grooves having a width only a little larger than the thickness of said sheet metal; an elongated window having opposite side edges in said



sheet metal mount; said window having engagement means in said opposite side edges of the mount window for engaging said axial grooves of the unit; and means in said elongated window for permitting preliminary positioning of said unit therein and for axially sliding said unit into engagement with said engagement means.

4,291,627

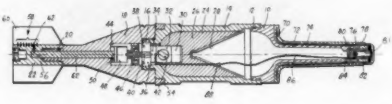
ELECTRICAL FUZE WITH A PLURALITY OF MODES OF OPERATION

Richard T. Ziemba, Burlington, Vt.; Joseph A. Kinzel, Liverpool, and Myron D. Egtvedt, Skaneateles, both of N.Y., assignors to General Electric Company, Burlington, Vt.

Filed Nov. 27, 1979, Ser. No. 97,763

Int. Cl.³ F42C *11/00*

U.S. Cl. 102—265 **8 Claims**



1. A fuze for a round of ammunition including

a source of electricity (**92**);

an electrical detonator (**42**), and

first means for providing two alternative circuits for coupling said source of electricity to said electrical detonator to provide detonation thereof, comprising

a plate (**74**) which serves both as a full frontal area impact switch and an electrostatic sensor to provide detonation signals.

4,291,628

SAFETY MECHANISM FOR FUSES

Jean Rosselet, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Jun. 5, 1979, Ser. No. 45,628

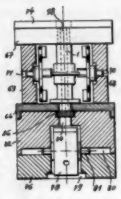
Claims priority, application Switzerland, Jun. 12, 1978, 6357/78

Int. Cl.³ F42C *9/02*

U.S. Cl. 102—276 **10 Claims**

1. A safety mechanism for fuses for projectiles, bombs, mines and other explosive devices, said mechanism delaying the arming of the fuse and comprising a central shaft, said central shaft having an axis, a motor spring acting on said central shaft for rotating said shaft about said axis, escapement means mounted on said shaft and a balance acted upon by said escapement means, said escapement means forming a mechanical connection between said shaft and said balance in the form of a dead-beat escapement, said balance, having a balance axis,

said axis extending perpendicularly to said shaft axis but intersecting therewith, said balance being capable of effecting sustained oscillations around said balance axis, said escapement means comprising a toothed escapement wheel fixedly mounted on said central shaft, said wheel having an odd number of teeth, said balance comprising two lateral cheeks, said cheeks being disposed one on each side of said central shaft, connecting means connecting said cheeks to one another, each said cheek comprising a cylindrical sector, each said sector having a geometric axis, each said axis being coincident with



said balance axis, each said sector defining an inner locking cylindrical surface and an exit lip, said surface and said lip constituting the active surface of said sector, said active surface being acted upon by said teeth of said escapement wheel, whereby successive locking and impulsing of said teeth of said escapement wheel act alternately on said active surfaces of said cylindrical sectors of said balance, thereby causing said balance to oscillate in two opposed directions, each said oscillation of said balance causing angular rotation of said central shaft, a predetermined angular rotation of said shaft causing arming of said fuse.

4,291,629

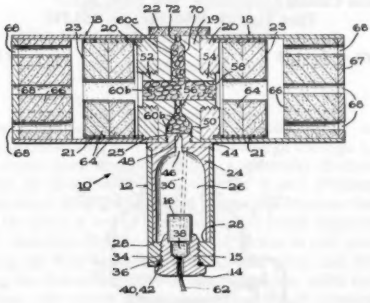
COMBINED T-SHAPE SMOKE PROJECTILE AND LAUNCHING ASSEMBLY

Osman F. Kezer, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 895,177, Apr. 10, 1978, abandoned. This application Nov. 6, 1979, Ser. No. 91,863

Int. Cl.[3] **F42B** *13/44*

U.S. Cl. 102—334 **9 Claims**



1. A multi-canister type projectile and related propelling charge housing assembly of T-shape configuration for providing a smoke screen from the projectile upon deployment exteriorly from a combat vehicle, said assembly comprising in combination:

(a) a propellant charge housing of cylindrical sleeve form having one open end and an opposite end wall with a central threaded aperture;

(b) an igniter assembly and means for removably mounting same in and closing off the end of said housing end wall opposite its open sleeve end portion;

(c) a projectile-propelling charge disposed within said housing and in operative ignitable contact with said igniter assembly;

(d) an open-skirted piston disposed for complemental slidable movement within the open-ended sleeve of said housing with said piston having a step-down center bore passageway in a threaded portion at an end opposite the open skirted portion;

(e) a pair of ignitable smoke-generating canister sub-assemblies mounted in axial alignment, and connectable with said piston, each sub-assembly comprising predetermined amounts of smoke and gas-generating compounds;

(f) mounting means for interjoining said canisters sub-assemblies in said axial alignment, said mounting means having in one side thereof a threaded portion for complemental attachment with said threaded portion of said piston so as to form a T-shape projectile whereby an axis through said aligned canisters is transverse to an axis through the center of said piston; and

(g) said mounting means having intercommunicating axial and radial passageways, ignition pellet means disposed within said axial passageway, and said radial passageway being in operative communication with the center bore of said piston, whereby ignition of said igniter assembly will effect both deployment of said projectile and ignition of said gas and smoke-generating compounds via said ignition pellet means.

4,291,630

MACHINE FOR EXTRACTING CENTRIFUGED PIPE

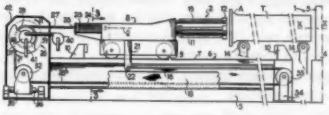
Pierre H. Fort, Nancy, France, assignor to Pont-a-Mousson S.A., Nancy, France

Filed Jun. 21, 1979, Ser. No. 50,858

Claims priority, application France, Jun. 23, 1978, 78 18812

Int. Cl.[3] **B61K** *5/00;* **B61B** *9/00, 12/10*

U.S. Cl. 104—173 R **11 Claims**



1. A machine for extracting centrifuged pipe comprising a rolling track oriented substantially horizontally and supporting an extracting carriage, a flexible element for traction of the carriage in two directions including an upper part for movement of the carriage in the reverse direction attached to the rear of the carriage and being positioned in a horizontal plane passing through the axis along which the carriage moves and a lower part for moving the carriage in the forward direction attached to a projection from the lower portion of the carriage, and means for simultaneously driving at the same speed the two parts of the flexible element in both directions, said upper part includes two strands which are symmetric about a vertical plane of symmetry through the carriage and which pass around a balanced wheel provided at the rear of the carriage.

4,291,631

RAILWAY CAR SIDE DISCHARGE DOOR LOCKING ARRANGEMENT

Willis H. Knippel, Palos Park, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 26, 1979, Ser. No. 33,586

Int. Cl.[3] **B65G** *67/00;* **B61D** *7/00, 19/00*

U.S. Cl. 105—252 **13 Claims**

1. In a railway hopper car including an underframe,

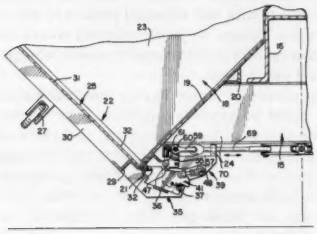
a car body supported on said underframe including a hopper structure,

a sloping wall on said hopper structure, said hopper structure including a discharge opening, a door hingedly connected to said body for relative swinging movement between open and closed positions, relative to said opening the improvement of a door locking mechanism comprising;

a keeper member on said door, a rotatable latch member supported on said hopper structure, said latch member having a keeper engaging portion in a rotated locked position being engaged by said keeper member,

a locking member pivotally connected to said hopper structure adjacent to said latch members,

said locking member having a first stop, a second stop on said latch member engageable with said first stop to



maintain said latch member in said rotated locked position relative to said keeper member,

means for pivoting said locking member between engaged and disengaged position comprising,

a linkage arrangement supported on said underframe including a link pivotally connected to said locking member,

actuating means connected to said link for moving the same in one direction to pivot said locking member,

said means including a cam follower connected to said underframe,

ground supported cam means below said cam follower engaged by said cam during movement of said car for moving said link in said one direction thereby disengaging said locking member, and

including means biasing said latch member to pivot to said locked position.

4,291,632

BOTTOM STRUCTURE FOR CONTAINERS, LOAD-CARRYING PLATFORMS OR THE LIKE

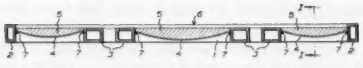
Bernd Barty, Frösön, Sweden, assignor to AB Nordplat, Ostersund, Sweden

Filed Mar. 19, 1980, Ser. No. 131,859

Claims priority, application Sweden, Mar. 3, 1979, 7902782

Int. Cl.³ B65D *19/02, 19/06*

U.S. Cl. 108—51.1 **3 Claims**



1. A bottom structure for load-carrying platforms, comprising a subjacent frame structure having longitudinal side beams and transverse beams extending therebetween having pockets for lifting forks, and a flooring of sheet material made of plywood resting on the frame structure, downwardly convex curved sheet-metal plates between said transverse beams secured at their edges to the upper portions of said transverse beams and said longitudinal side beams included in the frame structure, and a load-distributing rigid filling which supports the flooring between said beams filling the spaces above said plates up to the level of the upper sides of said transverse beams and the underside of said flooring.

4,291,633

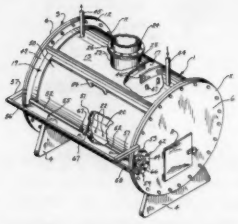
INCINERATOR

Gordon H. Hoskinson, 186 Mayfair Rd., Floral Park, N.Y. 11001

Filed Oct. 4, 1979, Ser. No. 81,686

Int. Cl.³ B09B *3/06*

U.S. Cl. 110—235 **12 Claims**



1. An incinerator, comprising a housing defining a combustion chamber and composed of a pair of end plates and a generally cylindrical shell extending between the end plates, the upper portion of the shell having a feed opening extending the entire length of the shell between said end plates, a feed door to enclose the opening, hinge means for hinging the lower portion of the door to the shell whereby the door can be moved between a closed and open position, a stack connected to the upper portion of the shell to discharge waste gases of combustion, air inlet means located in the lower portion of the shell for introducing air into the combustion chamber, said hinge means being located between the upper and lower extremities of the feed opening, and a curved shield attached to the lower portion of the door to close off the space between the lower portion of the door and the shell when the door is in the open position.

4,291,634

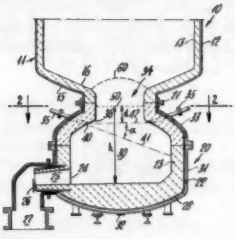
SOLID REFUSE DISPOSAL APPARATUS

Victor E. Bergsten, East Amherst; Edward P. Eardley, Getzville, and Thomas G. Halvorson, Lockport, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 29, 1980, Ser. No. 154,519

Int. Cl.³ F23G *7/00;* **C21B** *7/00;* **F27B** *1/10*

U.S. Cl. 110—235 **6 Claims**



1. In apparatus for disposing of pelletized refuse by conversion to useful gaseous product and inert solid residue, including a vertical shaft with an upper end for pelletized refuse providing a drying zone in the top section and a thermal decomposition zone in the intermediate section thereof to form a pelletized refuse bed, a hearth beneath said shaft and in flow communication with the lower end of said shaft, means for feeding oxygen-containing gas into said hearth as a combustion zone,

and a tap hole communicating with said hearth for discharging molten residue therefrom, the improvement comprising:

(a) a hearth volume V (ft^3) which is greater than that defined by the following equation:

$$V=7.28\times10^2G_rD_s^2/P_g$$

where

G_r=pelletized refuse maximum feed rate (lb. refuse/ft^2 shaft minimum cross-sectional area/second),

D_s=shaft minimum equivalent diameter (ft) and

P_g=furnace pressure (psia).

(b) an opening connection between the shaft and the hearth having minimum cross-sectional area between 0.044 and 1.0 times the shaft minimum cross-sectional area,

(c) a multiplicity of tuyeres as the means for feeding oxygen-containing gas into the hearth, each positioned at circumferentially spaced locations in the upper part of the hearth adjacent to the shaft-hearth connection (b) which are less than 35% of the vertical distance from the shaft-hearth connection (b) mid-point to the hearth floor, with

(d) said tuyeres inclined downwardly and away from the shaft-hearth connection (b) and directed so that said oxygen-containing gas does not impinge directly against said pelletized refuse bed.

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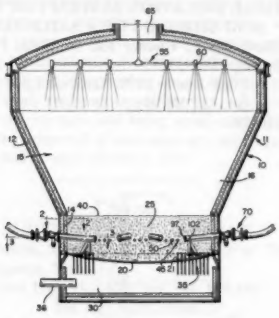
APPARATUS FOR FEEDING FLUIDIZED BED INCINERATOR, AND METHOD OF AUTOGENIC OPERATION OF SAME

James F. Nelson, Houston, Tex., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 20, 1979, Ser. No. 67,604

Int. Cl.³ F23G *5/00*

U.S. Cl. 110—245 **13 Claims**



1. In a fluidized bed incinerator for combusting readily friable agglomerates, said incinerator being of the type having a gas impervious reactor housing, a generally horizontally disposed air distribution plate mounted in and dividing said housing into a windbox below the plate and a reaction chamber above the plate, a bed of inert particulate solids supported on the air distribution plate, air passage means in said plate for directing air flow upwardly through said plate, and for preventing the downward flow of said particulate solids through said plate, said means comprising a plurality of openings distributed across the plate, air pressurizing means for providing pressurized air in said windbox, and to fluidize the bed, and a feed means extending horizontally into the bed for introducing feed directly into an interior portion of the bed, the improvement comprising:

the combination of said feed means and supplemental air means in which said feed means includes a generally horizontally disposed first tube and means for passing said agglomerates through said tube in a high velocity air stream, said supplemental air means comprising a second tube disposed in surrounding relation to the first tube to the point of discharge within the bed and means for passing a high velocity air stream through said second tube to introduce a high velocity air-feed stream at the point of discharge into the bed.

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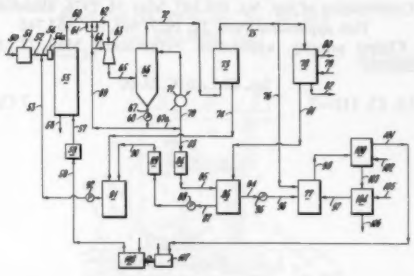
SOLID REFUSE DISPOSAL PROCESS

Victor E. Bergsten, East Amherst; Edward P. Eardley, Getzville, and Theodore F. Fisher, Tonawanda, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 29, 1980, Ser. No. 154,520

Int. Cl.³ F23G *7/00*; C10J *3/02*

U.S. Cl. 110—346 **12 Claims**



1. In a process for disposal of solid refuse feed by conversion to useful gaseous product and inert solid residue in a vertical column with an upper end for fresh solid refuse feed as a drying zone and a lower end providing a thermal decomposition zone for the refuse, and a hearth beneath said column as a combustion-melting zone, in which air is separated to produce at least 40% oxygen by volume and fed to said combustion-melting zone, molten residue is discharged from said combustion-melting zone, fine particulate-containing overhead gas is discharged from the column upper end, and said overhead gas is cleaned by cooling and scrubbing with recycle condensate from a scrubbing-separation zone to provide product gas and bottom condensate, the improvement comprising:

(a) a maintaining said vertical column and said hearth at pressure between 30 and 250 psia;

(b) dividing the bottom condensate from said scrubbing-separation zone into three parts;

(c) mixing a first part of said bottom condensate as a portion of said recycle condensate with said overhead gas for cooling and partial scrubbing thereof in said scrubbing-separation zone to form partially scrubbed overhead gas;

(d) cooling a second part of said bottom condensate externally supplied refrigerant and contacting the so-cooled second part with the partially scrubbed overhead gas from (c) in said scrubbing-separation zone as another portion of said recycle condensate;

(e) filtering the third part of said bottom condensate in a first filter section to remove solid particulate material therefrom to form liquid waste having an organic portion;

(f) flowing a minor portion of said liquid waste through a second filter section previously loaded with solid particulate from the bottom condensate third part and removing the solid particulate from said second filter section to form a slurry recycle;

(g) mixing said slurry recycle with fresh solid refuse to form said refuse feed;

(h) flowing the remaining major portion of said liquid waste to an incineration zone;

(i) diverting a minor part of said product gas while discharging the product remainder from said process, and passing the so-diverted product gas to said incineration zone;

(j) providing air and passing same to said incineration zone;

(k) completely oxidizing the organic portion of the liquid waste remainder in said incineration zone and forming hot discharge gas therein;

(l) flowing said hot discharge gas to a steam boiler zone along with feed water for heat exchanging therein, and generating steam from said feed water while partially cooling the incinerator discharge gas; and

(m) discharging said steam from said steam boiler zone and recovering energy therefrom as part of the refuse disposal process energy requirement.

4,291,637

FREELY ROTATABLE SOIL CULTIVATING IMPLEMENTS WITH LIQUID DISPENSING

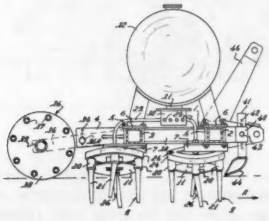
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 689,547, May 24, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,745

Claims priority, application Netherlands, May 27, 1975, 7506200

Int. Cl.³ A01C *23/02*

U.S. Cl. 111—7 **7 Claims**



1. A soil cultivating implement comprising a frame and at least one transverse row of tined soil working members rotatably mounted on upwardly extending shafts that are connected to said frame, the axes of rotation of the soil working members being defined by said shafts and inclined to the vertical, said axes being substantially aligned with one another in a transverse plane, at least one of said soil working members comprising a support and two downwardly extending tines diametrically mounted on said support with respect to the respective axis of rotation, said support together with said tines being freely rotatable about the corresponding shaft, said shaft being fixed to the frame and being non-rotatable relative to said tines during operation, the interior of said shaft comprising a cavity in communication with a fluid container supported on said implement, said cavity leading to a channelled feed member that comprises a downwardly extending extension of said shaft, the lower end of said feed member co-extending with said tines and said tines being rotatable around the feed member during operation responsive to contact with the ground, said lower end having an outlet port that communicates with an interior channel of said feed member, said outlet port being directed rearwardly with respect to the normal direction of travel, said feed member being detachable from the lower end of said shaft.

4,291,638

AGRICULTURAL IMPLEMENTS

Peter J. Renwick, Andover, England, assignor to Craven Tasker (Andover) Limited, Hampshire, England

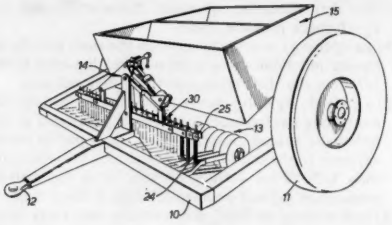
Filed Aug. 28, 1979, Ser. No. 70,652

Claims priority, application United Kingdom, Aug. 30, 1978, 35112/78

Int. Cl.³ A01C *5/00*

U.S. Cl. 111—61 **19 Claims**

1. An agricultural ground treating device arranged to be towed over the ground, comprising a chassis and a plurality of ground engaging implements movably mounted on the chassis, and loading means operative between the chassis and the implements to cause the implements all to engage the ground with a substantially equal force, in which said loading means comprises a pivoted beam arrangement having a number of first balance beams equal to half the number of said implements each end of each of said first balance beams being pivotally connected to a respective one of a pair of said implements, a number equal to half the number of first balance beams of second balance beams each end of each of said second balance beams being pivotally connected to the mid point of a respective first balance beam, a pair of third balance beams each end of each of said third balance beams being pivotally connected to the mid point of a respective second balance beam, and a final balance beam each end of said final balance beam being pivotally connected to the mid point of a respective one of said third balance beams, the final balance beam being movably mounted on the chassis, and fluid pressure operated means operative on the final balance beam to urge the beam arrangement and the implements connected to it towards the ground.



4,291,639

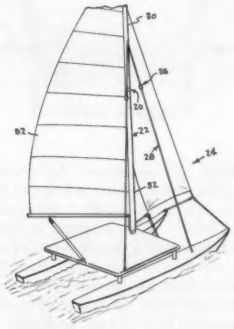
ELECTRICAL ISOLATION SYSTEM FOR THE MAST AND SHROUDS OF A SAILBOAT

Glenn A. Burdick, 701 County Rd. 80 West, P.O. Box 221, Tarpon Springs, Fla. 33589

Filed Jan. 8, 1979, Ser. No. 1,948

Int. Cl.³ B63B *35/00*; **B63H** *9/00*

U.S. Cl. 114—39 **11 Claims**



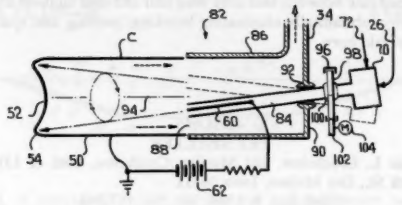
1. An electrical isolation system for use on sailboats having metal masts and shrouds for preventing accidental shocking or electrocution of persons who contact the lower portion of the masts and shrouds when an upper portion of the mast or a shroud come into contact with an electrical high voltage distribution or transmission line comprising a mast insulating member extending between an upper portion and a lower portion of said mast and a shroud insulating member extending between an upper and a lower portion of each shroud stay.

4,291,640

POWDER COATING APPARATUS FOR TWO-PIECE CANS

Robert D. Payne, Countryside, and Thomas F. Jordan, Oak Park, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sep. 9, 1977, Ser. No. 831,977
Int. Cl.³ C23C *13/08;* B05B *7/00, 1/28*
U.S. Cl. 118—50.1 **9 Claims**



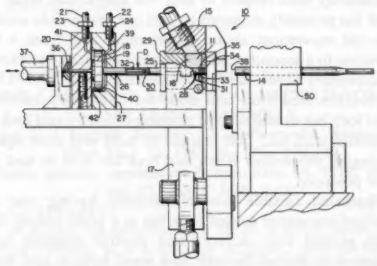
1. Apparatus for internally powder coating a closed end tubular member having an internal corner defined by an intersection of a body with an end and an axis, said apparatus comprising an elongated supply tube for supplying powder in a controlled stream and at an angle to the axis of the tubular member in the area of internal corner of the tubular member, means for effecting relative rotation of said supply tube and the tubular member generally about an axis of the tubular member to deposit powder to the corner and end of the tubular member in an annular pattern, supply means connected to said supply tube for delivering a powder stream to said supply tube, and fixed recovery means for withdrawing powder from the tubular member along the interior surface of the body of the tubular member to effect coating of the interior surface of the body by returning powder, said recovery means including a recovery tube having an open end of an internal diameter substantially corresponding to the internal diameter of the intended tubular member, said recovery tube having a wall and said supply tube extending through said wall, said supply tube terminating within said recovery tube and being small in cross section as compared to the open end of said recovery tube, and a suction source connected to said recovery tube.

4,291,641

LIQUID DISPENSING APPARATUS

Herman P. Nowak, Danvers, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Dec. 21, 1979, Ser. No. 106,194
Int. Cl.³ B05C *7/00*
U.S. Cl. 118—408 **6 Claims**



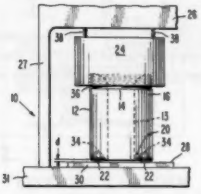
1. Apparatus for dispensing a metered quantity of a viscous liquid comprising:
a reservoir having coaxial apertures on opposing faces;
a housing having a chamber;
a hollow piston being disposed within said chamber;
a rod being slidingly disposed within said piston to form a cavity between an end of said piston and an end of said rod for containing a metered quantity of said liquid;
means attached to said housing for reciprocally moving said piston relative to said rod in opposite directions to open said cavity to receive said liquid, and to close said cavity to dispense said liquid; and
means attached to said rod for sliding said piston and rod in and out of said apertures in said reservoir.

4,291,642

NOZZLE FOR DISPENSING VISCOUS FLUID

Ronald F. Kolc, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,013
Int. Cl.³ B05C *5/02*
U.S. Cl. 118—415 **6 Claims**



1. A nozzle adapted to uniformly dispense a thick film viscous fluid onto a substrate, said nozzle comprising:
a hollow tubular member having a fluid receiving port at one end thereof and a fluid dispensing orifice at the other end thereof, said fluid dispensing orifice having a preselected shape and size so that when said fluid is dispensed therethrough said fluid flows in said preselected shape onto said substrate;
a fixedly mounted base for supporting said substrate;
means for resiliently mounting said tubular member to said base and for urging said tubular member toward said substrate; and
means cooperatively connected to said tubular member for preventing said orifice from moving closer to said substrate than a predetermined spacial distance, said means for preventing avoiding sliding contact with said substrate.

4,291,643

DEVELOPING APPARATUS IN A MAGNIFICATION-VARIABLE COPIER

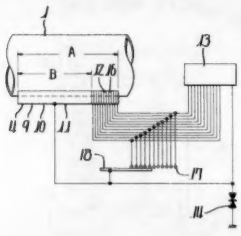
Yuochi Kobayashi, Yokohama, and Shinichi Kamiyama, Kawasaki, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 970,982
Claims priority, application Japan, Dec. 19, 1977, 52-152582
Int. Cl.³ B05C *11/00;* G03G *15/10*
U.S. Cl. 118—669 **6 Claims**

1. An apparatus for the development of an electrostatic latent image in a magnification-variable copier, comprising:
a photosensitive surface movable along a predetermined path;
latent image forming means for forming an electrostatic latent image to be transferred to a copying medium on said photosensitive surface;
developing electrode means located in an opposed relationship to said photosensitive surface for developing said electrostatic latent image formed on said photosensitive surface, said developing electrode means having a length sufficient to develop a full size copy, said developing electrode means including a plurality of electrode segments, each of said plurality of electrode segments being

electrically insulated from each other, said plurality of electrode segments being serially arranged in a row, said row being parallel to the direction of width of said photosensitive surface and perpendicular to a direction of travel of a copying medium passing through said copier, said plurality of electrode segments being divided into a first electrode portion consisting of one electrode segment and a second electrode portion consisting of at least one electrode segment, said first electrode portion having a length sufficient for the development of a reduced size copy, said second electrode portion having a length sufficient for the development of the excess copy area between the full size copy and the reduced size copy;

biasing potential supply means for supplying first and second biasing potentials, said first biasing potential being the potential necessary for the development of said electrostatic latent image, said second biasing potential being a potential greater than the surface potential of said photosensitive surface such that development of said electrostatic latent image is prevented, said biasing potential supply means being coupled to supply said first biasing potential to said first electrode portion; and



biasing switching means coupled between said biasing potential supply means and said second electrode portion for selectively coupling one of said first or second biasing potentials to said second electrode portion;

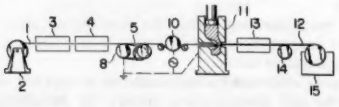
whereby said biasing switching means couples said first biasing potential to said second electrode portion when a full size copy is to be made on said copying medium by said copier and couples said second biasing potential to said second electrode portion where a reduced size copy is to be made on said copying medium by said copier.

4,291,644

APPARATUS FOR FABRICATING COMPOSITE METAL WIRE

Kazumichi Kawai; Yasuo Kaneko; Keizo Abe; Hideo Matsuo; Yoshinori Kishi; Yasuhiko Miyake, and Yoshihiro Matsuyama, all of Hitachi, Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan

Continuation of Ser. No. 937,830, Aug. 29, 1978, abandoned.
This application Nov. 19, 1979, Ser. No. 95,281
Claims priority, application Japan, Aug. 31, 1977, 52-104447; Sep. 6, 1977, 52-106922
Int. Cl.³ B05C *3/02*
U.S. Cl. 118—704 **14 Claims**



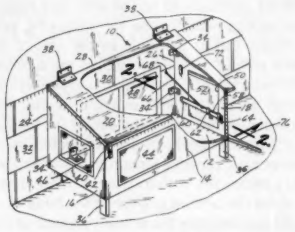
1. Apparatus for fabricating a composite metal wire comprising an extruder for extruding a cladding of soft metal around a core of hard metal; a core feed unit located upstream of said extruder for feeding said core to said extruder; a haul-off unit located downstream of said extruder for receiving said composite wire from said extruder; drive means for forcedly driving said core feed unit and said haul-off unit so as to maintain said core under constant low tension of not more than 50% of the breaking tension of said core; and a dancer roll assembly located between said core feed unit and said haul-off unit, said dancer roll assembly comprising a fixed pulley and a movable pulley, said pulleys having their axes in a horizontal plane and said dancer roll assembly serving to compensate for error in the feed rate between said core feed unit and said haul-off unit, thereby substantially eliminating breaking, peeling, and sparking of said core.

4,291,645

PET SHELTER

Wayne L. Cruchelow, and Marilyn Cruchelow, both of 1315-39th St., Des Moines, Iowa 50311

Filed Jun. 9, 1980, Ser. No. 157,563
Int. Cl.³ A01K *1/03*
U.S. Cl. 119—19 **5 Claims**



1. A pet shelter adapted to be mounted over an opening in a house wall, said wall having an interior surface and an exterior surface, said opening having an openable window therein, a small hole in said house wall providing communication between said interior and exterior surfaces thereof, said shelter comprising:

a housing having a top wall, a front wall, and opposite side walls, said top wall, said floor and said side walls each having rear edges adapted to abut against said exterior surface of said house wall in surrounding relation to said opening therein;

one of said lateral side walls having a door opening therein; a door within said door opening;

hinge means connecting said door to said one lateral side wall for hinged swinging movement both inwardly and outwardly with respect to said one lateral side wall;

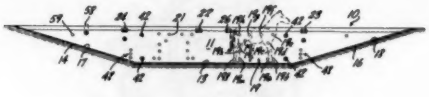
a lock bar pivotally mounted to said one lateral side wall for pivotal movement about a horizontal axis from a first position to a second position wherein said lock bar extends transversely across said door opening;

first bracket means on said door for retentively receiving said lock bar in said second position whereby said lock bar operates with said first bracket to hold said door against swinging movement when said lock bar is in its said second position;

an elongated flexible control member having one end thereof connected to said lock bar at a point spaced from said pivotal axis thereof, said control member being adapted to extend through said small hole in said house wall so that the other end of said control member is on the interior surface of said house wall whereby said control member may be grasped and manipulated to cause movement of said lock bar between said first and second positions.

4,291,646
WHIRLPOOL THERAPY FACILITY AND METHOD OF TREATMENT

Angelo Leonaggeo, Jr., Seven High St., Bedford Hills, N.Y. 10507

Continuation of Ser. No. 849,256, Nov. 7, 1977, Pat. No. 4,183,329. This application Aug. 29, 1979, Ser. No. 70,880
The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.
Int. Cl.[3] A01K *15/02;* A61D *11/00*
U.S. Cl. 119—29 3 Claims

1. A whirlpool therapy facility for applying water turbulence massage to selected portions of the body of a horse, comprising:

a channel shaped tub for containing a pool of water and having a substantially flat horizontal bottom positioned between a pair of opposed upstanding wall members;

a plurality of output nozzles carried by each of the wall members and opening into the pool, the nozzles being arranged in an inverted substantially U-shaped pattern on each of the wall members and arranged to correspond approximately to the relative positions of the legs and torso of a horse standing on the bottom, including at least one separate nozzle on each wall positioned to direct a water turbulence massage at each of the following areas of the horse: the shank, the knee, the forearm and elbow area, the chest, the shoulder, the haunch, the thigh, and with respect to the rear leg, the stifle, the gaskin, the hock, and the fetlock and pastern portions;

means for injecting water into the pool under pressure through selected ones of said nozzles, thereby to provide turbulence in the pool for massaging portions of the body of a horse situated in the tub between the wall members; and

means for treating the water contained by the tub to extract debris and other foreign matters therefrom, in which said water treatment means comprises:

a plurality of suction type skimmers carried by the wall members at the surface of the water;

at least one drain carried by the bottom of the tub;

a pump in fluid flow communication with the drain and said skimmers to extract water from the tub;

a plurality of filtering elements through which water is forced by said pump; and

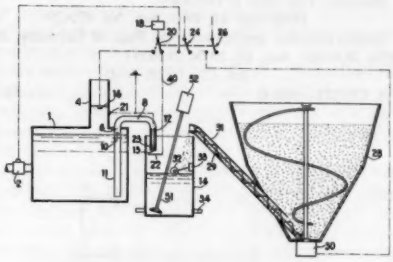
a plurality of outlet openings carried by the wall members by which water enters the tub after passage through said filtering elements.

4,291,647
DEVICE FOR DISTRIBUTING LIQUID IN GIVEN DOSES FOR A MACHINE FEEDING AS DESIRED YOUNG SUCKLING MAMMALS

Michel A. J. Legrain, Foulbec, 27210 Beuzeville, France

Filed Mar. 12, 1980, Ser. No. 129,770
Claims priority, application France, Mar. 14, 1979, 79 06463
Int. Cl.[3] A01K *5/00, 9/00*
U.S. Cl. 119—51.11 12 Claims

1. A device for distributing a liquid in given doses for the mixture thereof, in a collecting recipient, with at least one other powdered ingredient such as powdered milk, for feeding young suckling mammals, said device comprising a source of liquid, a reservoir, a valve connecting the reservoir to the source, a calibrated tube upwardly extending the reservoir, means for checking the level of the liquid contained in the tube, a syphon having a short branch which extends into the reservoir and a long branch which extends into the collecting recipient, means for detecting the flow of liquid through the syphon and mounted in the collecting recipient and means connecting the liquid flow detecting means and the means checking the

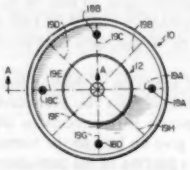


level of the liquid in the tube to the valve for opening the valve automatically when, in the absence of flow through the syphon, the liquid in the tube descends to a level lower than a set level.

4,291,648
LIVESTOCK FEEDER

Gregory A. Garvin, Rte. 1, Box 106-A, Broad Run, Va. 22014

Filed Apr. 23, 1979, Ser. No. 32,492
Int. Cl.[3] A01K *5/01*
U.S. Cl. 119—61 8 Claims



1. A feeder-watering trough comprising:

a unitary trough having an upwardly projecting centrally disposed portion, a bottom member and an outer retaining wall, said bottom member connecting said centrally disposed portion and said outer retaining wall together to form a continuous area in which feed or water may be positioned, said upwardly projecting central portion including a substantially centrally disposed opening on an underside portion of said trough;

a base member; and

at least one central support removably attached within said substantially centrally disposed opening of said unitary trough at an uppermost end thereof and being in adjustable engagement with said base member at a lower end thereof, said central support being designed to adjustably support said trough above ground level;

said upwardly projecting centrally disposed portion including an unobstructed inclined upper surface which ensures the even distribution of feed into said continuous area formed between said centrally disposed portion and said outer retaining wall and wherein said central support is positioned within said substantially centrally disposed opening of said unitary trough to provide an unobstructed area beneath said trough;

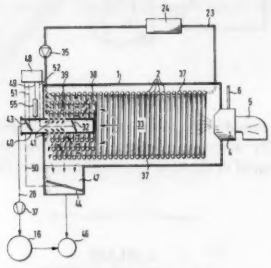
said outer retaining wall including an inwardly curved lip to prevent the discharge of feed or water over the top of said outer retaining wall.

4,291,649

PROCESS AND APPARATUS FOR DUCTING FLUE GAS WITHIN A BOILER

Wilfried Böder, Barsinghausen, Fed. Rep. of Germany, assignor to PPT Pyrolyse-und Prozessanlagentechnik GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Jun. 11, 1979, Ser. No. 47,629
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2826048; Aug. 18, 1978, 2836251
Int. Cl.³ F22B 7/00
U.S. Cl. 122—136 R 29 Claims



1. A process for ducting flue gases produced in the firing space of a boiler, said boiler being of the type in which the flue gases within the boilder give up heat by being passed through heat absorbers, themselves cooled by heat transport fluid, and run ultimately to an off-gas stack, said process comprising the steps of:

dividing at least a portion of the flue gases coming from the firing space into at least two part-currents,

cooling the separate part-currents to different degrees by having them give up heat to the transport fluid,

mixing at least a portion of the part-currents together again to form a mixed gas current whose temperature, following mixing, is controlled by selecting the proportions of the part-currents in said mixed gas current;

running at least part of the mixed gas current to an external flue gas user.

the undivided portion of the flue gases and the portion of the mixed gas current not going to the user being run as far as through the last heat absorber to the off-gas stack.

8. Apparatus for ducting or routing flue gases produced in the firing space of a boiler, said boiler being of the type in which the flue gases within the boiler give up heat by being passed through heat absorbers cooled by a heat transport fluid, said flue gases being ultimately provided to an off-gas stack, said apparatus comprising:

means for dividing at least a portion of the flue gases from said firing space into at least two part-currents;

means including at least one heat absorber for cooling the separate part-currents to different degrees;

means for mixing at least a portion of the part-currents together again to form a mixed gas current, said mixing means including means for controlling the temperature of said mixed gas current by selecting the proportions of the separate part-currents included therein;

means for providing at least a portion of said mixed gas current to an external glue gas user; and

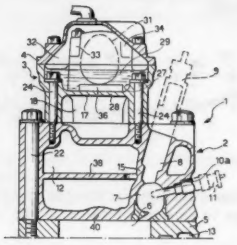
means for running the undivided portion of the flue gases and the portion of the mixed gas current not going to the user as far as through the last of said heat absorbers to said off-gas stack.

4,291,650

CYLINDER HEAD FOR COMPRESSION-IGNITION INTERNAL COMBUSTION ENGINE

Antonio Formia, Turin, and Giorgio Filtri, Moncalieri, both of Italy, assignors to Fiat Veicoli Industriali S.p.A., Turin, Italy

Filed Jan. 3, 1980, Ser. No. 109,426
Claims priority, application Italy, May 23, 1979, 68096 A/79
Int. Cl.³ F01P 3/02; F02F 1/26
U.S. Cl. 123—41.82 A 2 Claims



1. A cylinder head for a compression ignition internal combustion engine, wherein:

(a) the cylinder head comprises a cast iron lower part which is to be fixed onto the cylinder block of said engine and which is formed to define walls delimiting both a cooling chamber through which engine coolant can flow, and a plurality of cavities providing for each of the cylinders of the engine a precombustion chamber, a seat for a fuel injector, and induction and discharge ducts,

(b) the cylinder head further comprises an aluminium intermediate part mounted on said cast iron lower part, and an upper cap element of aluminium surmounting said intermediate part, the upper surface of the aluminium intermediate part being shaped to define a bath for lubricating oil and being provided with support means for rotatably supporting the camshaft of said engine,

(c) said cast iron lower part and said aluminium intermediate part define between them a breather cavity which communicates with the outside and which when the cylinder head is mounted on said engine block is arranged to communicate with the space underlying the piston within each cylinder of the engine, so as to enable exhaust of air in said space as each piston travels towards its bottom dead centre position,

(d) said aluminium intermediate part is formed to define a number of vertically-extending apertures which communicate at their lower ends with said breatner cavity and which at their upper ends open out into the upper surface of the said intermediate part at a level above the bottom of said bath, said apertures serving to limit the level of lubricating oil within the bath, and

(e) said cast iron lower part is formed to define bolt holes for the location of fixing bolts for securing the cast iron lower part to said engine block, said bolt holes lying within the external periphery of said intermediate part in alignment with respective ones of said apertures whereby access to said fixing bolts is possible without the need to remove the aluminium intermediate part from the cast iron lower part.

4,291,651

INTERNAL COMBUSTION ENGINE

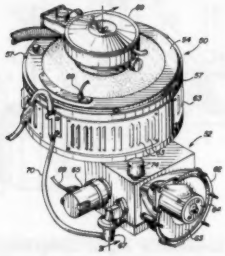
Tony R. Villella, 2030 N. Black Canyon Hwy., Phoenix, Ariz. 85009

Filed Oct. 6, 1978, Ser. No. 949,372
Int. Cl.³ F02B 57/06
U.S. Cl. 123—44 R 21 Claims

1. In an internal combustion engine including a stationary crankshaft having an axially offset portion between its ends; a rotating crankcase journalled about said crankshaft and enclos-

ing said offset portion of the crankshaft; a plurality of cylinders mounted on said crankcase in angularly spaced relation; a piston received in each of said cylinders; and a connecting rod for each piston having one end pivotally connected to its piston by a wrist pin and the other end pivotally connected to said offset portion of the crankshaft, the improvements consisting of:

(a) a closed pressurized lubricating system for the journalled relation of said crankcase to said crankshaft; the pivotal mounting of said wrist pins in said cylinders, and the journalled relation of said connecting rods to said offset portion of said crankshaft;



(b) a fuel inlet portion in each of said cylinders and a stationary valve plate operatively associated with each of said fuel inlet portions;

(c) a spark plug for each cylinder and a retainer for each of said spark plugs, said retainer taking the form of a snap ring which, in addition to maintaining its spark plug in assembled relation on its cylinder, dissipates heat from that spark plug; and

(d) a plurality of exhaust ports in each cylinder, together with a valve associated with each of said exhaust ports, one of said exhaust ports being a primary port which communicates with an environmental exhaust system and receives the initial gases of combustion.

4,291,652

HYDRAULIC TAPPET

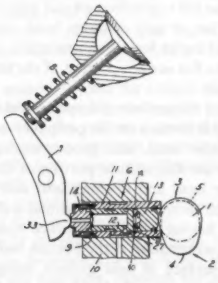
Peter R. Trzoska, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 26, 1979, Ser. No. 78,880

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1978, 2843918

Int. Cl.³ F01L *1/14, 1/24*

U.S. Cl. 123—90.57 **6 Claims**



1. A hydraulic tappet for a valve train of an internal combustion engine comprising;

a tappet piston defining a reservoir chamber;

a tappet cylinder slideably receiving said tappet piston;

a second lower piston slideably disposed in said cylinder and spaced apart from said tappet piston to define a pressure chamber therebetween;

the tappet cylinder being tubular in shape and defining a sidewall of said pressure chamber:

a camshaft having a cam surface thereon with a base circle portion and transitional and elevational portions;

a track surface laterally spaced and recessed on each side of said base circle portion and level with said transitional and elevational portions;

said track surface engaging an end of said cylinder and said cam surface engaging an end of said second piston;

a passageway fluidly connecting said reservoir with said pressure chamber when said cylinder is in a first position with respect to said tappet piston;

said passageway includes an annular recessed groove circumscribing the outer surface of a sidewall of said tappet piston having a port extending therethrough between said groove and reservoir chamber, a longitudinal groove recessed in an inner sidewall of said tubular cylinder, said longitudinal groove located on said cylinder to be constantly in fluid communication with said annular groove in said tappet piston and in fluid communication with said pressure chamber when said cylinder is in a first axial position with respect to said tappet piston;

a shoulder defining the bottom end of said longitudinal groove integral with said cylinder with said shoulder located above the bottom end of said tappet piston to cut off fluid communication between said longitudinal groove and said pressure chamber when said cylinder is in a second axial position with respect to said tappet piston;

a Belleville spring mounted within said pressure chamber biasing said tappet piston and lower piston apart from each other;

said reservoir chamber connectable to a pressurized fluid supply in said internal combustion engine through a passageway extending through said tubular cylinder such that when said reservoir is fluidly connected to said pressure chamber, fluid passes between the said two chambers to separate the two pistons a predetermined distance.

4,291,653

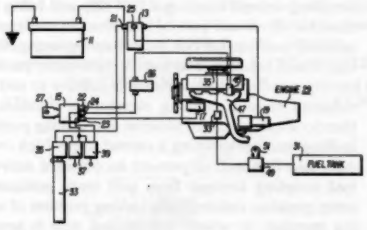
DOOR CAR STARTER

Cleveland T. Tucker, Rte. 2, Box 49B, Dinwiddie, Va. 23841

Filed Jul. 19, 1977, Ser. No. 816,973

Int. Cl.³ F02N *17/00*

U.S. Cl. 123—179 BG **9 Claims**



1. An automatic starting system for an internal-combustion engine powered vehicle having an operator's cab comprising:

a starting means for starting said engine;

a battery for energizing said starting means;

one or more vehicle closure means providing access to the operator's cab;

a closure sensor means for monitoring at least one of said closure means and for allowing energy to flow from said battery to the starting means and said engine in response to one of said closure means being opened;

a closure sensor control means for selectively activating and deactivating the closure sensor means;

an internal-combustion engine sensor which automatically interrupts the flow of energy to said starting means in response to said engine starting.

4,291,654

PULLBACK STARTER FOR INTERNAL COMBUSTION ENGINES

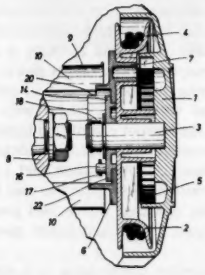
Alfred Obermayer, Lambach, Austria, assignor to Bombardier-Rotax Gesellschaft m.b.H., Gunskirchen, Austria

Filed Nov. 5, 1979, Ser. No. 91,511

Claims priority, application Austria, Dec. 4, 1978, 8625/78

Int. Cl.³ F02N *1/00*

U.S. Cl. 123—185 BA **5 Claims**



1. A pullback starter for an internal combustion engine having an input shaft, which is non-rotatably connected to a driven clutch member, said starter comprising

a frame,

an axle fixed in said frame,

a rope drum rotatably mounted on said axle,

a rope which is wound on said drum and adapted to be pulled from said drum so as to rotate the latter in a predetermined sense,

a pullback spring tending to rotate said drum opposite to said predetermined sense,

a one-way coupling element which is pivoted to said drum on a pivotal axis that is parallel to the axis of said axle, said coupling element carrying a first stop and being pivotally movable about said pivotal axis from an inner position to an outer position for one-way coupling engagement with said clutch member, and back to said inner position,

a locking member which is movable relative to said axle and mounted in said coupling element for rotation relative thereto about an axis of rotation to a locking position, said locking member carrying a second stop which cooperates with said first stop to prevent an outward movement of said coupling element from said inner position to said outer position, and to a non-locking position of said locking member, in which said second stop is arranged to permit said movement and said locking member engages said coupling element in the sense of said outward movement, and

a constraining spring, which extends around and is rotatable about said axle and torsionally prestressed to be normally in frictional contact with said axle and has at one end a spring arm, which protrudes laterally from said axle and engages said locking member, said constraining spring tending to move said locking member relative to said axle by means of said spring arm in the sense of said outward movement.

4,291,655

COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Yoshio Yamakawa, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

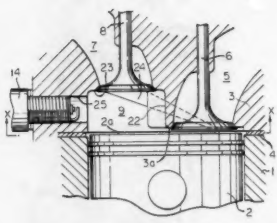
Division of Ser. No. 778,230, Mar. 16, 1979, Pat. No. 4,166,436.

This application Jun. 21, 1979, Ser. No. 50,559

Claims priority, application Japan, Nov. 15, 1976, 51-136243

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—306 **4 Claims**



1. An internal combustion engine comprising:

a cylinder block,

a cylinder head mounted on said cylinder block,

a piston reciprocally movable in said cylinder block, said cylinder head and said piston defining a combustion chamber having a fixed volume therebetween when said piston reaches the top dead center position,

an intake valve in said cylinder head for leading a combustible mixture into said combustion chamber,

an exhaust valve in said cylinder head for discharging the exhaust gas to the atmosphere, said combustion chamber comprising a first region which forms a substantial combustion chamber and has a circumferential wall and a bottom wall, said combustion chamber further comprising a second region for creating a squish flow of a combustible mixture and a third region communicating said first region with said second region and guiding said squish flow towards the circumferential direction of said piston for causing a direct impingement of said squish flow upon the bottom wall of said first region and for creating a turbulence and a strong swirl motion of the combustible mixture in said first region,

said piston has a substantially flat top surface and said cylinder head has an inner wall having a flat surface portion, said first region being defined by a recess formed on the inner wall of said cylinder head, said second region being defined by the flat top surface of said piston and by the flat surface portion of said cylinder head, said third region being defined by at least one gradually inclined groove formed on the flat surface portion of the inner wall of said cylinder head;

said recess has a circumferential cylindrical wall and a bottom wall and is formed on the periphery of the inner wall of said cylinder head, said groove extending along the periphery of the flat surface portion of the inner wall of said cylinder head and opening into said recess tangentially to the circumferential cylindrical wall of said recess, said groove having a bottom surface upwardly inclined towards and terminating at the bottom wall of said recess, the bottom surface of said groove being directly connected to the bottom wall of said recess and being substantially uniformly inclined throughout its extent;

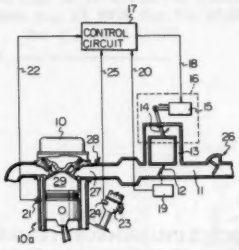
wherein said intake valve is disposed in the flat portion of the cylinder head, while said exhaust valve is disposed in the bottom wall of said recess; and

a spark plug having a spark gap in said combustion chamber.

4,291,656
METHOD OF CONTROLLING THE ROTATIONAL SPEED OF AN INTERNAL COMBUSTION ENGINE

Hideo Miyagi, Toyota, and Jiro Nakano, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 6, 1979, Ser. No. 55,365
Claims priority, application Japan, Jul. 14, 1978, 53-85239
Int. Cl.³ F02D *11/10;* **B60K** *31/00*
U.S. Cl. 123—320 **6 Claims**



1. A method of controlling the rotational speed of an internal combustion engine having an intake passage, a throttle valve disposed in said intake passage, and a bypass passage which communicates said intake passage at a position located upstream of said throttle valve with said intake passage at a position located downstream of said throttle valve, said method comprising the steps of:

(a) providing a reference speed signal;

(b) providing a rotational speed signal having a value corresponding to the actual rotational speed of said engine;

(c) comparing said rotational speed signal and said reference speed signal;

(d) increasing the flow of air through said bypass passage and decreasing said reference speed signal by a predetermined value for use in providing a next reference speed signal when said rotational speed signal is equal to or less than said reference speed signal, and decreasing the flow of air through said bypass passage when said rotational speed signal is greater than said reference speed signal;

(e) repeating the steps (a), (b), (c) and (d) recited above at predetermined time intervals, whereby the difference between a respective rotational speed signal and a respective reference speed signal can be reduced.

4,291,657
DIESEL ENGINE SPEED GOVERNOR

Ernest R. Codrington, 1580 Cornell Ave., Coquitlam, British Columbia, Canada (V3J 3A1)

Filed Nov. 17, 1978, Ser. No. 961,523
Int. Cl.³ F02D *1/04;* **G05D** *11/00*
U.S. Cl. 123—387 **6 Claims**

1. A fast idle speed governor for a diesel engine having a fuel pump mechanically driven by the engine and a common rail fuel injection system, the governor comprising:

a valve body having a fuel inlet and a fuel outlet;

a bore within the body communicating adjacent a first end of the bore with the fuel inlet;

a valve piston slidable within the bore under the influence of pressure of fuel entering the inlet;

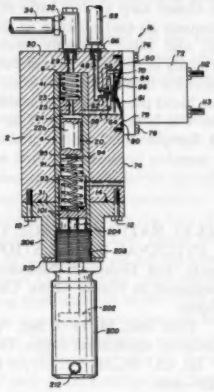
a passageway in the piston able to move, with sliding of the valve piston, between a first position that allows fuel to flow from the fuel inlet, through the passageway to the fuel outlet to a position where no fuel flows;

a control valve within the valve body movable between a closed position where fuel cannot flow through the governor to an open position where fuel can flow;

means to open and close the control valve;

variable control means biasing the valve piston to define the first position for the valve piston and thus to set the fast idel of a diesel engine at a predetermined speed;

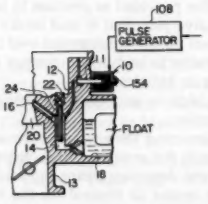
a fluid cylinder connected to the body near a second end of the bore opposite the first end, the cylinder being axial with the bore and having an internal piston anda piston rod connected to the internal piston extending towards the bore, the variable control means for biasing the valve piston being between the rod and the valve piston so that the flow of fuel from the outlet increases when the rod moves towards the valve piston and the flow of fuel decreases when the rod moves away from the valve piston, said control means for biasing the valve piston comprising axial first and second coil springs, the second spring being shorter than the first spring, the first spring being compressed betwen the rod and the valve piston when the internal piston is in a position distal the valve piston, the second spring being compressible between the rod and the valve piston when the internal piston is in a position proximate the valve piston increasing the pressure of fuel from the fuel inlet required to decrease the flow of fuel from the inlet to the outlet.



4,291,658
AUTOMOTIVE ENGINE CARBURETOR

Kenji Masaki, Yokohama, and Koyo Nakamura, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 854,230, Nov. 23, 1977, abandoned, which is a continuation of Ser. No. 654,742, Feb. 23, 1976, abandoned.
This application Oct. 26, 1978, Ser. No. 954,766
Claims priority, application Japan, Feb. 5, 1975, 50-15129
Int. Cl.³ F02M *7/00, 23/00*
U.S. Cl. 123—440 **4 Claims**



1. An automotive engine carburetor for use with an electronic closed loop air-fuel ratio control system to supply adequate air-fuel mixture to an internal combustion engine for effectively reducing noxious components in exhaust gases from the engine by a three-way catalytic converter, comprising:

an intake passage provided with a venturi;

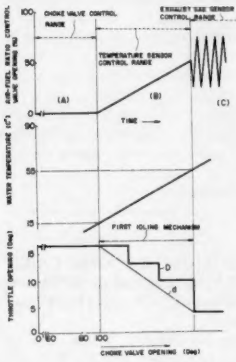
a float bowl for containing fuel therein;
a fuel passage extending between said venturi and said float bowl;
an air bleed passage connected to said fuel passage for delivering air thereto;
an auxiliary air passage connected to said fuel passage for delivering air thereto; and
an electromagnetic valve assembly of on/off type serving as an actuator operatively connected to said air bleed passage for controlling the rate of air flow in response to an electrical pulsating signal applied thereto from said electronic closed loop air-fuel ratio control system to supply an adequate air-fuel mixture to said internal combustion engine, said valve assembly having a member movable reciprocally in response to said pulsating signal between a first position in which the amount of air passing through said air bleed passage is at a maximum and a second position in which said amount of air is at a minimum, and means for providing adjustment of the distance of the valve member between said first and second positions.

4,291,659

AIR-FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Mikio Suzuki, and Toshifumi Nishimura, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 14, 1979, Ser. No. 103,718
Claims priority, application Japan, Dec. 28, 1978, 53-161960
Int. Cl.³ F02M *7/12, 1/10;* **F02B** *75/10*
U.S. Cl. 123—440 **9 Claims**



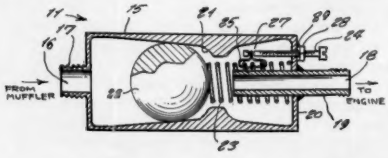
1. An air-fuel ratio control system for an internal combustion engine of an automotive vehicle, comprising:
an intake passage leading to the engine;
an exhaust passage communicating with the engine;
a choke valve provided in position in said intake passage;
a throttle valve provided in said intake passage;
venturi means positioned between said choke valve and said throttle valve in said intake passage for sucking the fuel including air bubbles;
means provided in said exhaust passage for detecting the air-fuel ratio;
means for detecting the engine temperature;
control means for receiving the output signals from said air-fuel ratio detecting means and said engine temperature detecting means to control on the basis thereof the air flow which will be mixed with the fuel, in such a way that the actual fuel-ratio is controlled at the three stages, that is, (A) when the engine temperature is lower than a first predetermined value, the air-fuel ratio is controlled only by said choke valve, (B) when the engine is at a temperature of said first predetermined value to a second predetermined value, said air-fuel ratio control means is actuated according to the output signals of said engine temperature detecting means so as to control the air-fuel ratio, and (C) when the engine temperature is higher than said second predetermined value, said air-fuel ratio control means is actuated according to the output signals from said air-fuel ratio detecting means so as to control air-fuel ratio.

4,291,660

RECYCLING EXHAUST FUMES VALVE

Isaac Molyneaux, 90-41 Corona Ave., Elmhurst, N.Y. 11737

Filed Feb. 28, 1980, Ser. No. 125,321
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **1 Claim**



1. An accessory mounted on an internal combustion engine for recycling exhaust fumes thereof, comprising in combination, a valve unit mounted along a pipe connected between an exhaust pipe of the engine and an intake manifold of the engine, said valve comprising a cylindrical casing having a first inlet end in fluid communication with the exhaust pipe, and a second outlet end having a pipe extending in said casing toward said first end in fluid communication with the intake manifold; said cylindrical casing having a conical valve seat formed therein between said second outlet end and said first inlet end; a spherical ball positioned within said cylindrical casing between said first inlet end and said valve seat for movement therebetween, said valve seat being formed by said cylindrical casing and including a constricted portion extending from near said first inlet end toward said second outlet end and terminating in an annular flange portion near said second outlet end; a compression spring mounted about said pipe having a first end adjacent said second outlet end of said casing and a second end extending beyond said annular flange, said second end of said spring abutting against said spherical ball to urge said ball toward said first inlet end, said spherical ball being closed in said conical seat when the gas pressure from said first inlet end is greater than the force exerted by said compression spring; and a means for varying the compression force of said spring, said means comprising a threaded bolt extending through said second outlet end of said cylindrical casing, said threaded bolt having a first end outside of said casing and a second end in said casing in close proximity to said spring, said second end of said threaded bolt having a groove formed therein, said means further comprising a ring through which a plurality of turns of said spring pass, said ring having an eyelet formed remote from said plurality of turns positioned in said groove of second end of said threaded bolt, whereby the force of said compression spring on said ball may be varied by turning said threaded bolt and therefore varying the location of said plurality of turns.

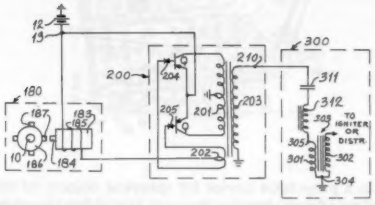
4,291,661
INDUCTIVE-CAPACITIVE MODULATED IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 812,912, Jul. 5, 1977, Pat. No. 4,176,647, Ser. No. 868,118, Jan. 9, 1978, Pat. No. 4,168,692, Ser. No. 878,792, Feb. 17, 1978, Pat. No. 4,169,445, Ser. No. 913,437, Jun. 7, 1978, abandoned, Ser. No. 923,828, Jun. 12, 1978, Pat. No. 4,216,412, Ser. No. 960,871, Nov. 15, 1978, Pat. No. 4,206,736, Ser. No. 35,013, May 1, 1979, abandoned, and Ser. No. 44,301, May 31, 1979, Pat. No. 4,258,296. This application Aug. 13, 1979, Ser. No. 65,891

Int. Cl.³ F02P *15/10*

U.S. Cl. 123—606 **5 Claims**



1. An ignition system for an engine which develops motive power by burning fuel, said system including an ignition transformer and an alternating current energy source, comprising the combination of:

a magnetically generating pulse timer having a sensing inductor coupled to said energy source; and

an inductive-capacitive circuit connected to and intermittently powered by said energy source, said circuit including a capacitor and a primary winding of said ignition transformer series connected to said capacitor, said circuit being passive and devoid of switches and arc-gap devices, said energy source including active electronic power generating means for producing oscillations, and a coupling transformer having a first winding connected to said active means, a second winding coupled to said sensing inductor and a third winding coupled to said circuit.

4,291,662
COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE EQUIPPED WITH AN AUXILIARY COMBUSTION CHAMBER

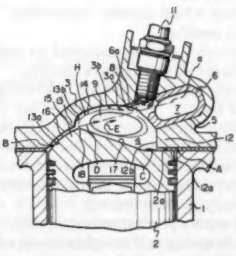
Norihiko Nakamura, Mishima; Kiyoshi Nakanishi, and Takashi Kato, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 30, 1979, Ser. No. 43,794

Claims priority, application Japan, Jul. 20, 1978, 53/87665

Int. Cl.³ F02B *23/08*

U.S. Cl. 123—661 **10 Claims**



1. An internal combustion engine, comprising:

a cylinder block having a cylinder bore therein;

a cylinder head mounted on said cylinder block having an auxiliary combustion chamber formed therein;

a first raised portion formed on the periphery of an inner wall of said cylinder head so as to project downwardly, having on its lower end a flat bottom face;

a piston reciprocally movable in said cylinder bore and having a top face which has a flat peripheral portion approachable to said flat bottom face so as to create a first squish area therebetween at the end of the compression stroke for spouting out a first squish flow along the top face of said piston;

a main combustion chamber, defined by the inner wall of said cylinder head and the top face of said piston;

a constricted connecting passage connecting said main and auxiliary combustion chambers;

an intake valve movably mounted on said cylinder head for leading a combustible mixture into said main combustion chamber;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

a second raised portion formed on the top face of said piston at a position opposite to said first raised portion with respect to an axis of said piston and having a rear face and a front face exposed to said main combustion chamber, said rear face being approachable to the inner wall of said cylinder head so as to create a second squish area therebetween at the end of the compression stroke for spouting out a second squish flow which moves forward in the upper interior of said main combustion chamber in the direction opposite to the spouting direction of said first squish flow and at said connecting passage, said first and second squish flows cooperating with each other to create a strong swirl motion rotating about a horizontal axis in said main combustion chamber;

a spark plug arranged in said connecting passage; and

a third raised portion formed on the inner wall of said cylinder head above said second raised portion and having a bottom wall which cooperates with said rear face of said second raised portion for creating said second squish area therebetween, said auxiliary combustion chamber and said connecting passage being located such that a burning jet formed in said auxiliary combustion chamber is injected into said main combustion chamber substantially directly linearly at said second squish area.

4,291,663
BALL THROWING MACHINE

Gordon H. Buck, Torrance; Otto L. Gabler, Lawndale; Eugene J. Kilroy, Palos Verdes Estates, and Richard Leoncavallo, Anaheim, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

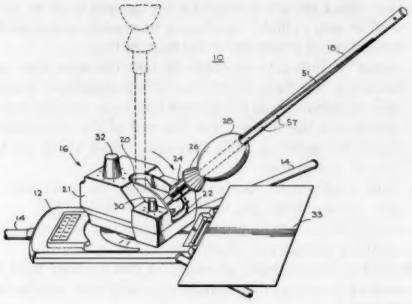
Filed Feb. 4, 1980, Ser. No. 118,140

Int. Cl.³ F41B *7/00*

U.S. Cl. 124—26 **10 Claims**

1. A ball throwing machine comprising a base; a rod mounted to be supported by the base; means for selecting a direction in which the rod projects with respect to the base, including means for pre-setting an angle of projection from the vertical, means for holding the rod in the vertical position, means for releasing the rod to free fall from the vertical, means

for stopping the fall of the rod when it reaches the pre-set angle of projection; and means for propelling a ball along a path



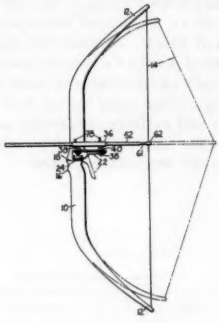
initially defined by the axis of the rod after the rod has reached the stopping means.

4,291,664

PROJECTILE SHOOTING GUIDE FOR BOWS

Jim Z. Nishioka, 1268 Hemlock, N. W., Salem, Oreg. 97304

Filed Apr. 30, 1979, Ser. No. 34,287
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—41 A **11 Claims**



10. For use with a bow of the type having a bowstring and tensioning means connected to the bowstring, a combination comprising

(a) a projectile; and

(b) a projectile shooting guide comprising support means for use on a bow,

(c) an elongated guide member for support on a bow by said support means and having a forward portion and a rearward portion,

(d) said guide member when supported on a bow by said support means extending toward a bowstring on a bow and positioned longitudinally in a direction of shooting motion of a bowstring for guiding said projectile to be shot by a bowstring;

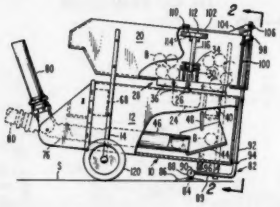
(e) said projectile including multiple nocking means for each respectively receiving a bowstring.

4,291,665

PROPULSION DEVICE FOR SPHERICAL OBJECTS HAVING AN OSCILLATING SUPPORT FRAME PROVIDING A PROGRAMMED DISCHARGE OF SAID OBJECTS

C. Malcolm Bash, Roosevelt, and Joseph Pasquito, Lawrenceville, both of N.J., assignors to Prince Manufacturing Co., Inc., Princeton, N.J.

Filed Oct. 26, 1979, Ser. No. 88,434
Int. Cl.³ F41F *1/04*; A63B *69/38*
U.S. Cl. 124—56 **10 Claims**



9. In a propulsion device for spherical objects, of the type including a frame structure having a propulsion chamber and a hopper, a discharge barrel mounted on the frame structure, a rotary distributor within the hopper for feeding spherical objects to the propulsion chamber, and means in the propulsion chamber for propelling said objects from the barrel, an improvement for imparting oscillating motion to the barrel comprising:

(a) means below the propulsion chamber for gripping a surface in which the propulsion device is supported; and

(b) a motion translating mechanical driving linkage extending between the distributor and the gripping means, adapted for bodily imparting oscillating movement to the propulsion chamber, hopper, and barrel in response to rotation of the distributor, comprising a pivot shaft mounted on the frame structure, a link mechanically connected between the distributor and the rockshaft, said link being oscillated as a mechanical response to each rotation of the distributor for rocking the shaft first in one and then in the opposite direction, and a crank connected at one end to the shaft to rock therewith and anchored at its other end to the surface-gripping means for imparting a predetermined quantum of cyclic oscillatory motion bodily to the frame structure and the barrel mounted thereon as a mechanical response to each cycle of rotation of the distributor.

4,291,666

DRESSING TOOL FOR GRINDING WHEELS

Edward D. Garner, 4200 N. 48th St., Lincoln, Nebr. 68504

Filed Nov. 21, 1979, Ser. No. 96,485
Int. Cl.³ B24B *53/08*
U.S. Cl. 125—11 TP **9 Claims**

1. A grinding wheel dresser, comprising:

a fixed first member,

a second member slidably mounted on said first member for lateral reciprocation relative thereto,

a third member adapted to hold a dressing tool and slidably mounted on said second member for vertical reciprocation relative thereto and lateral reciprocation therewith,

said third member adapted to selectively move laterally with said second member without vertical reciprocation and to move vertically relative thereto simultaneously with the lateral reciprocation thereof,

a template with a predetermined profile,

means for mounting said template in a predetermined spaced relationship from said first member,

an elongated tracing rod having a first end and a second end,

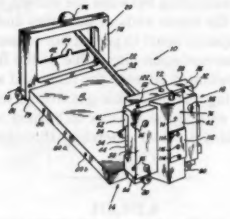
means extending said first end through said first and second members free of engagement therewith and into said third member,

means for engaging said first end with said third member against independent movement relative thereto,

a fulcrum support on said rod,

means securing said fulcrum support against vertical and horizontal movement but retaining capability for said fulcrum support to turn in place,

said rod arranged for slidable movement relative to said fulcrum support,



said second end of said rod disposed and adapted for manual movement in contact with said template profile whereby said first end acts against said third member and effects action against said second member to reproduce the template profile by a dressing tool secured to said third member, and

the sliding capability of said rod relative to said fulcrum support serving to maintain all lines of movement of said first end correspondingly planar with lines of movement of said second and third members as the orientation of the axis of said rod changes.

4,291,667

CUTTING WHEEL

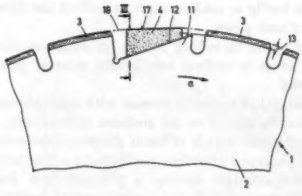
Rolf Eichenlaub, Quellenweg 26, D-5900 Siegen-Volnsberg, and Boris Z. Novakovic, Am Homberg 28, D-5902 Netphen 2-Frohnhausen, both of Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,414

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853650

Int. Cl.³ B28D *1/04*

U.S. Cl. 125—15 **10 Claims**



1. Cutting wheel for natural and artificial rock material, especially road surfaces of asphalt or concrete, comprising a carrier disk, cutting segments on the circumference of said carrier disk, and at least two extra segments spaced apart along the circumference of the carrier disk and made of a material harder than that of the normal cutting segments, each said extra segment being constructed with a beveled, lower narrow side by which it is attached to a base formed on the circumference of the carrier disk and having a corresponding counter bevel ascending in the direction of rotation of the carrier disk, the beveled narrow side of the extra segments projecting from both side faces of the base.

4,291,668

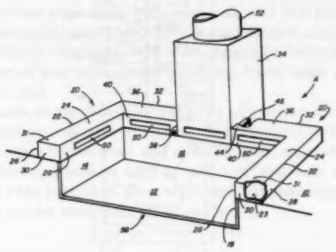
GRIDDLE VENTILATING SYSTEM

Erwin W. Moeller, 1839 Robertson Ave., Galesburg, Ill. 61401

Filed Mar. 5, 1979, Ser. No. 17,415

Int. Cl.³ F24C *3/00, 15/20;* F24F *9/00*

U.S. Cl. 126—41 R **9 Claims**



1. A vent apparatus for ventilating an indoor grill or griddle mounted in a table or surface, comprising:

(a) a plurality of hollow, walled inlet arm members mounted on the surface adjacent the grill about a portion of the periphery thereof;

(b) said inlet arm members each having an elongate collection slot formed in a wall thereof adjacent the grill to receive and conduct smoke and vapors away from the grill;

(c) a receiving chamber mounted with the surface and in communication with said inlet arm members for receiving smoke and vapors therefrom;

(d) fan means for drawing smoke and vapors away from the grill into said inlet arm members and said receiving chamber; and

(e) outlet means for transporting the smoke and vapors upwardly away from said receiving chamber to ventilate the grill.

4,291,669

EFFICIENT FUEL BURNING STOVE OR FURNACE WITH THERMAL ENERGY SLOW PROPAGATION FLUE STRUCTURE

Robert H. Herne, Jr., 121 Woodbridge Rd., York, Me. 03909

Filed Jun. 25, 1979, Ser. No. 51,683

Int. Cl.³ F24C *15/28*

U.S. Cl. 126—83 **16 Claims**

1. A new and improved stove or furnace for combusting and extracting heat from wood and carbonaceous fuels comprising:

firebox means for primary combustion of said fuels;

a flue structure coupled to said firebox comprising a plurality of flue gas decelerating chambers for slowing propagation of flue gas, heat exchange to the environment, and further combustion of fuel constituents, said chambers coupled in series through restricting and accelerating passageways for maintaining draft between chambers;

tubular conduit means extending from the firebox through said flue structure and formed with orifices for injecting burning flue gas from the firebox primary combustion into said series coupled chambers to enhance secondary burning in said chambers;

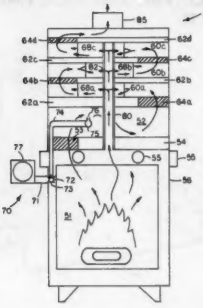
and outlet means for venting the output of said series alternating accelerating and decelerating flue gas structure.

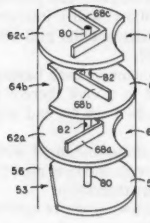
16. A new and improved method for combusting and extracting heat from wood and carbonaceous fuels comprising:

igniting and burning said fuel in a primary combustion;

alternately accelerating and drafting, and decelerating and spreading, the flue gas from said primary burning step, maintaining draft during the accelerating steps and slowing propagation, exchanging heat to the environment, and further combusting or pyrolizing the constituents of the flue gas during the decelerating step;

and injecting a jet of burning flue gas directly from the primary combustion through a separate pathway into the decelerating and spreading flue gas during the decelerat-





ing and spreading steps to enhance further combustion of the flue gas constituents during deceleration and spreading.

4,291,670

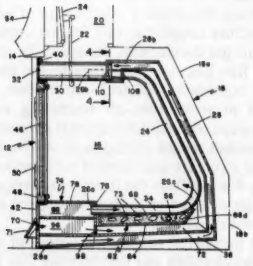
GAS FIRED FIREPLACE INSERT WITH HEAT EXTRACTOR

Everett C. Hvatt, 3157 Peg Leg Mine Rd., Jamul, Calif. 92035,

Filed Jul. 8, 1980, Ser. No. 166,765

Int. Cl.³ F24B *7/00*

U.S. Cl. 126—121 **3 Claims**



1. A gas fired heat extractor insert for the cavity of a fireplace, comprising:

a plurality of substantially parallel C-shaped heat exchanger tubes having open lower and upper ends;

a substantially C-shaped heat exchanger duct surrounding the tubes and having an open lower end adjacent the lower ends of the tubes and an open upper end adjacent the upper ends of the tubes, the duct extending substantially across the width of the tubes;

a glass door fireplace closure for sealing the frontal opening of the cavity and attached to the ends of the tubes and the duct;

first manifold means for coupling the lower ends of the tubes to a first air inlet extending through the fireplace closure;

conduit means for coupling the lower end of the duct to a second air inlet extending through the fireplace closure;

second manifold means for coupling the upper ends of the tubes and the duct to a plurality of air outlets extending through the fireplace closure, including a plurality of outlet pipes extending between the outlets in the fireplace closure and the upper ends of the tubes and the duct, the pipes being spaced apart to permit hot exhaust gases to rise upwardly therebetween into a flue of the fireplace; and

nozzle means mounted beneath the tubes and above the duct for discharging a combustible gas from a source connectable thereto so that the gas can be burned with air drawn through a third air inlet extending through the fireplace closure.

4,291,671

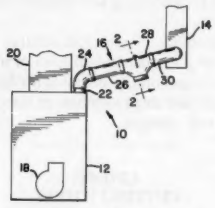
APPARATUS FOR FUEL ECONOMY

Dennis R. Senne, 5167 W. 167th St., Oak Forest, Ill. 60452

Continuation-in-part of Ser. No. 909,839, May 26, 1978, abandoned. This application Oct. 25, 1979, Ser. No. 88,166

Int. Cl.³ F23L *3/00*

U.S. Cl. 126—292 **1 Claim**



1. Apparatus for improving the efficiency of combustion in a heat-exchanger automatic gas-fired furnace system, comprising:

(1) an exhaust conduit for venting the effluent products of combustion gases from said system,

(2) means for imposing a dwell in the flow of said effluent gases, without restricting the latter, including:

(3) a fixed baffle in said conduit to deflect the flow of some or all of said gases,

(a) said baffle including means for reducing its effective area so as to deflect less of the exhaust gases passing thereby

(4) an enlarged chamber in stream with said exhaust conduit, hermetically closed to the ambient atmosphere, enclosing said baffle into which effluent gases are deflected,

(a) said enlarged chamber comprising a Tee union in said exhaust conduit having a through-flow for effluent gases between inlet and outlet ports at opposite ends of said Tee, the depending leg of the Tee being hermetically sealed against the ingress and engress of gases, said baffle being fixedly mounted normal to said through-flow of effluent gases to deflect the gases into the leg of the Tee in their passage to the outlet port, said baffle being centered with respect to the central axis of the depending leg of the Tee,

(5) said chamber and baffle being constructed and arranged to provide an unrestricted area of flow around said baffle substantially equal to or greater than said exhaust conduit, so as to retard, without restricting, the flow of the products of combustion therethrough,

(6) whereby said dwell augments the combustion cycle by

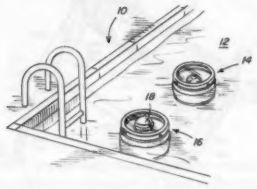
enhancing the temperature and time parameters of the latter to decrease the CO, the excess air, and the H_2O condensate, and to increase the CO_2, in the products of combustion ultimately discharged through the exhaust conduit, thus, further to augment the heat in said furnace system without the input of additional fuel.

4,291,672

FLOATABLE SOLAR HEAT MODULES

Jay W. Ricks, 4121 Cambridge Dr., Bakersfield, Calif. 93306

Filed Jun. 16, 1980, Ser. No. 160,010
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—415 **5 Claims**



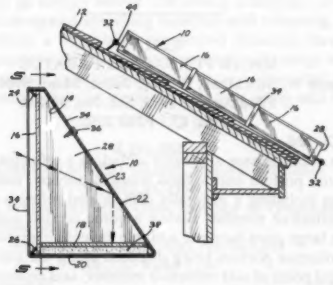
1. A floatable solar heating module for use in heating bodies of water comprising; a heat conducting plate for transferring heat to the water, a solid heat storage means in contact with said plate and a transparent plate spaced from said heat storage means to transmit solar radiation to said heat storage means, said heat storage means being enclosed within a storage container, said container supporting said transparent plate above said heat storage means, said container being in contact with a heat conducting panel, said heat conducting panel being spaced from said heat conducting plate and receiving solar radiation through said transparent plate, said heat storage means positioned so as to receive conduction heat from said heat conducting panel and conduct a portion of said heat to said heat conducting plate, said module including a float positioned so as to surround said container.

4,291,673

PASSIVE SOLAR ROOF ICE MELTER

Roger T. Deutz, 4844 Vincent Ave., South, Minneapolis, Minn. 55410

Filed Aug. 9, 1979, Ser. No. 65,127
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—417 **6 Claims**



1. A passive solar roof ice melter for use on a sloping enclosure roof, said melter including:

A. an elongated frame including:

i. An elongated flat bottom wall partially bounded by parallel, spaced apart front and rear edges, and

ii. a flat reflecting wall made of material which reflects solar energy, said flat reflecting wall being coextensive with the length of the bottom wall and extending upwardly from the entire rear edge of the bottom wall at an acute angle with respect to said bottom wall;

B. a first plate translucent to passage of solar energy and other radiant heat transferring energy, said plate being coextensive with the length of the frame walls and extending from the entire front edge of the bottom wall to the entire top edge of the reflecting wall, said first plate being in perpendicular relationship to said bottom wall;

C. means to close the ends of the triangles formed by end edges of said bottom and reflecting frame walls and said plate; and

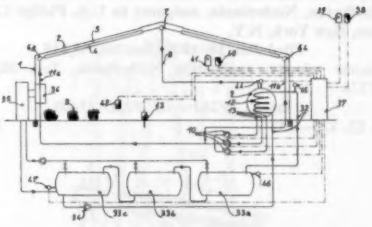
D. means to position said melter to rest above the sloping enclosure roof with a first end edge portion of said flat and reflecting frame walls and said first plate adjacent to and overlying a bottom edge of said roof, and with a second end edge portion of those walls and that plate lying generally up the roof from the edge thereof.

4,291,674

PROCESSES AND DEVICES FOR CLIMATIZING GREENHOUSES

Paul Y. Comte, Antibes, and Rene J. Repetti, Mougins, both of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Filed Feb. 21, 1979, Ser. No. 13,688
Claims priority, application France, Feb. 17, 1978, 78 04999
Int. Cl.³ F24J *3/02;* **A01G** *1/00*
U.S. Cl. 126—419 **17 Claims**



1. Device for climatising greenhouses and other shelters for growing plants which comprises a transparent covering, solar collectors consisting of two transparent plates which define between them a space in which a heat-carrying liquid circulates and a closed circuit including the said collectors, which collectors are placed under said transparent covering, the heat-carrying liquid being composed of a suspension in water of a product which is heavier than water, which partly absorbs the visible spectrum, and means for varying the concentration of the said suspension as a function of the outside luminosity so that the said collectors constitute an artificial shade having a variable and controllable opacity.

4,291,675

SOLAR ENERGY COLLECTOR

Muhammed A. Rahman, 1121 Arlington Blvd., T-221, Arlington, Va. 22209

Continuation-in-part of Ser. No. 867,972, Feb. 6, 1978, abandoned. This application Dec. 21, 1979, Ser. No. 102,027
Int. Cl.³ F24J *3/02;* **A23C** *3/04*
U.S. Cl. 126—432 **9 Claims**

1. A solar energy collector comprising:

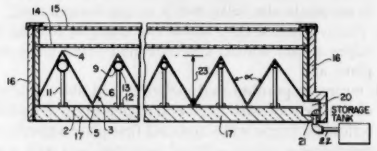
base means;

solar energy absorbing means positioned in a plane spaced from said base means, said solar energy absorbing means having an accordian-like shape comprising a plurality of alternating angularly disposed lower valleys and upper ridges interconnected by generally planar surfaces, said

lower valleys being positioned spaced from but immediately adjacent to said base;

fluid supply means positioned between said solar energy absorbing means and said base means immediately adjacent said upper ridges and being adapted for supplying a fluid adjacent said upper ridges; and

trough means adapted for receiving a flow of fluid collected on said base;



whereby fluid supplied adjacent said upper ridges will then flow down said planar surfaces thereby transferring heat absorbed by said solar energy absorbing element to the fluid, until dropping off said lower valleys onto said base, the close positioning of said lower valleys to said base providing means for maintaining fluid contact between said lower valleys and the fluid flowing on said base thereby further improving the heat transfer efficiency.

4,291,676

SOLAR COLLECTOR, COMPRISING AN EVAPORATION/CONDENSATION SYSTEM

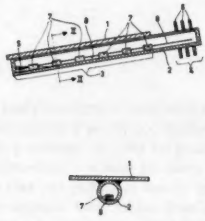
George A. A. Asselman, and Adrianus J. Van Mensvoort, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 14, 1979, Ser. No. 48,416

Claims priority, application Netherlands, Jun. 30, 1978, 7807174

Int. Cl.³ F24J *3/02*; F28D *15/00*

U.S. Cl. 126—433 **1 Claim**



1. A solar collector, which comprises a sealed tube having an evaporation zone receiving solar energy during operation and a condensation zone arranged during operation at a level higher than that of the evaporation zone; an evaporable heat transport medium contained in said tube, said heat transport medium during operation being evaporated in the evaporation zone and being condensed in the condensation zone, the resulting condensate returning to the lower end of the evaporation zone under the influence of gravity; a plurality of pieces of a liquid-absorbing material arranged within the evaporation zone of the tube in contact with the inner surface thereof and extending in a row longitudinally of said tube, adjacent liquid-absorbing material pieces being spaced from each other, said spaced liquid-absorbing material pieces each respectively retaining a portion of the returning condensate and thereby interrupting the return of all the condensate to the lower end of the evaporation zone whereby, upon start of operation, evaporation of the heat transport medium occurs also along the length of the evaporation zone rather than solely at the lower end of said evaporation zone; and a shaft for mounting said pieces to maintain the same in contact with the inner surface of the evaporation zone of the tube in which the shaft is freely rotatable about the tube axis.

4,291,677

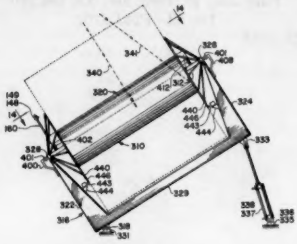
SOLAR ENERGY COLLECTOR

Robert J. Monk, 175 Shadybrook, Cedar Hill, Tex. 75104

Continuation-in-part of Ser. No. 864,617, Dec. 27, 1977, Pat. No. 4,161,942. This application Sep. 22, 1978, Ser. No. 944,865

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **17 Claims**



1. Solar energy collection device for concentrating light and infrared energy rays onto a small surface area whereby energy resulting from said energy rays striking said small surface area is utilized by various means to accomplish useful work comprising: a plurality of symetrically arranged supports, said supports forming a parabola shaped frame; support means rotatably supporting said parabola shaped frame and maintaining the direction of an axial plane of said parabola shaped frame in alignment with the direction of light and infrared energy rays arriving from the sun; means adjustably supporting said supports to said support means; said means adjustably supporting said supports comprising a plurality of threaded shaft secured at spaced intervals about said supports and means to move said threaded shaft relative to said support means; a plurality of flexible strips of film, said strips having an upper reflective surface with said upper reflective surface bearing against the supports, said strips being positioned across said supports from the outer support of said parabola shaped frame to the opposite side of the support through the center of said parabola shaped frame, means to tension said strips over said support, said reflective film further arranged to form a parabola shaped mirror surface to reflect said light and infrared energy rays to the focus of said reflective film strips; and a collector assembly secured at the focus of said parabola shaped mirror and adapted to receive said light and infrared energy rays.

4,291,678

SOLAR FURNACE APPARATUS

Benjamin W. Strickland, Box 30, Joliet, Mont. 59041

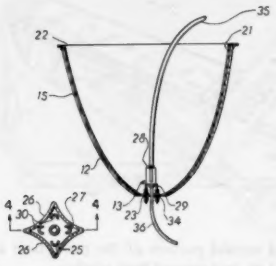
Filed Aug. 7, 1979, Ser. No. 64,493

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **4 Claims**

1. A solar furnace apparatus including a reflector portion, a collector portion and a fluid transfer portion, said reflector portion including a generally dish-shaped reflective member, said reflective member having a conic section configuration with a large open face and a highly reflective internal surface, said collector portion being disposed along the axis of and at the focal point of said reflective member, said collector portion including a chamber formed of a plurality of concave longitudinal conductive metal sections joined at their edges, the cross section of said longitudinal sections forming a generally star-shaped configuration, said concave longitudinal sections being disposed substantially parallel to the longitudinal axis of said reflective member, end sections affixed to the free edges of said concave longitudinal sections and therewith forming an enclosed chamber, a central conduit means extending from one of

said end sections to a point adjacent the other end section but spaced therefrom, a plurality of discrete longitudinal baffle means disposed within said chamber around said central conduit means, inlet and outlet means communicating with said chamber, the distance across the cross section of said collector portion being less than the length of said concave longitudinal



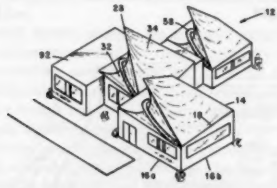
sections thereof, mounting means for the securing of said collector portion adjacent the apex of said reflective member, said fluid transfer portion including conduit means connected to said inlet and outlet means of said collector portion and means associated with said conduit means for circulating fluid to a heat storage or heat dissipating means.

4,291,679

STRUCTURAL SOLAR COLLECTOR

Joseph A. Kersavage, 4022 Sequoyah Ave., Knoxville, Tenn. 37919

Filed Mar. 3, 1980, Ser. No. 126,880
Int. Cl.³ F24J *3/02*; G02B *5/08*
U.S. Cl. 126—438 **5 Claims**



1. An apparatus for concentrating and collecting radiant energy from an energy source comprising a reflector member and curved elongated absorbing member, said reflecting member comprising a hyperbolic paraboloid structure having a reflective concave surface directed toward said energy source for reflecting said radiant energy to a curved, elongated focus, said elongated collecting member extending along said focus.

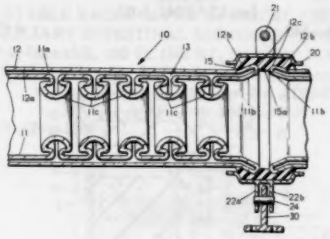
4,291,680

DOUBLE-WALLED GLASS SOLAR ENERGY COLLECTOR

Rodney V. White, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 26, 1979, Ser. No. 107,218
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—443 **10 Claims**

1. A solar energy collector comprising, in combination, a transparent outer glass tube, an inner glass tube concentrically inserted in said outer tube with an annular space defined between the outer wall of the inner tube and the inner wall of the outer tube, means for sealing the axial ends of said tubes together to permit evacuating the said annular space, means for flowing a heat transfer fluid thru the inner glass tube, a solar energy absorbent coating on the outer wall of said inner glass tube, thereby trapping solar energy incident on said outer tube within said heat transfer fluid and said inner glass tube, said inner glass tube having at least one axial portion of its length deformed inwardly to form a bellows-shaped expansion sec-



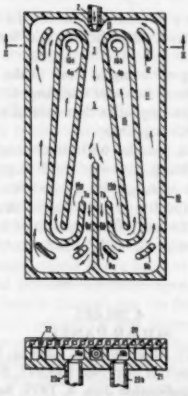
tion to absorb differences in expansion of said inner and outer tubes, said bellows-shaped section having the same outer diameter as said inner tube and the outer diameter of the inner tube being at least 85% of the inner diameter of the outer tube.

4,291,681

FLAT PLATE HEAT EXCHANGERS

Robert T. Berringer, 571 Ascot Pl., Land O Lakes, Fla. 33539

Filed Feb. 19, 1980, Ser. No. 122,489
Int. Cl.³ F24J *3/02*; F28D *7/00*
U.S. Cl. 126—445 **1 Claim**



1. A flat plate solar energy collector comprising a bottom plate of rigid plastic foam material, said bottom plate having four side walls and multiple flow guides within said side walls, an inlet nozzle on a first of said side walls, a straight flow guide opposite said nozzle and extending from a second side wall whereby fluid from the inlet nozzle is split into two flow channels, the area between said nozzle and said straight flow guide comprising a diffuser means, means comprising two elongated curved discontinuous flow guides to further split said two flow channels into four flow channels, two exit ports in said bottom plate with each exit port lying within the confines of one of said two elongated curved discontinuous flow guides, said exit ports being located near the nozzle side of the solar collector, plural relatively short flow guide means for directing fluid from said second side wall back to said first side wall to be combined with flow from said nozzle, wherein all of said flow guides are formed as a unitary structure with said plastic bottom plate, a transparent plastic top plate secured over said bottom plate to admit sunlight to fluid in the collector.

4,291,682

SOLAR COLLECTOR

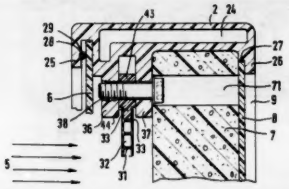
Uriel Baratz, Katznelson 2, Tivon, Israel

Filed May 21, 1979, Ser. No. 40,879

Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2822970

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—448 **4 Claims**



1. A solar-heat collector, comprising:

a frame made of lightweight plastic,

a blackened heat exchanger made of lightweight plastic, through which a heat-conducting medium flows, secured in said frame, the heat exchanger comprising a double-walled, multi-bridged plastic plate with a series of parallel channels and separating walls extending from one medium-carrying member of the frame to the other,

a feed manifold and a discharge manifold for the heat-conducting medium, both in said frame and secured to opposite ends of the heat exchanger, each manifold having two projecting walls between which the heat exchanger is clamped,

feed and discharge pipe connections for the heat-conducting medium, respectively attached to said feed and discharge manifolds,

a light-transmitting covering in front of the heat exchanger,

heat insulation behind the heat exchanger,

the frame having joining sides that extend between and join the two manifolds together,

the heat exchanger, parallel with its channels and

separating walls, being provided with a pair of projecting borders at each side, guidingly received in the joining sides of the frame by an interconnecting lug extending between and outwardly from each pair of borders, and

fastening means securing said borders to said joining sides via said lug.

4,291,683

SOLAR PANEL

Bruce R. Bayles, 1921 Riverview St., Eugene, Oreg. 97403

Continuation-in-part of Ser. No. 833,017, Sep. 14, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,099

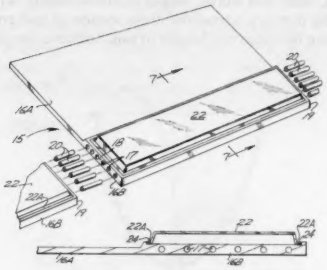
Int. Cl.³ F24J *3/02*; **E04D** *1/00*

U.S. Cl. 126—448 **4 Claims**

1. A solar panel for securement to a roof surface in rows for converting solar radiation to thermal energy, said panel comprising in combination,

a planar base constructed of monolithic elastomeric material having a first portion adapted to be secured to and overlie an underlying supporting surface and be overlapped by a like solar panel, a base second portion integral with and of greater thickness than said first portion and adapted to partially overlie the first portion of an adjacent panel, said second base portion defining multiple conduit passageways open at their ends and extending lengthwise of said second base portion, communicating means at the panel extremities and communicating the passageways of the solar panel with those of an adjacent solar panel, said communicating means including surfaces for the insertion of nipples to join adjacent panels and

a transparent cover on said second portion of said base and defining an air space, said cover constituting a barrier to minimize convection losses from said second portion wherein said transparent cover has marginal areas inset



within said second portion of the panel base and is not overlapped by said second base portion.

4,291,684

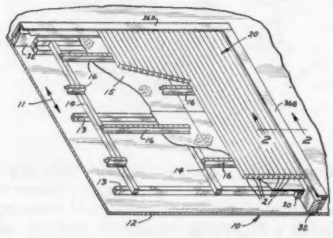
GLAZING FOR SOLAR HEAT COLLECTORS WITH PROVISIONS FOR THERMAL EXPANSION OF THE GLAZING

Frank D. Werner; Lowell A. Kleven, and Richard C. Greig, all of Jackson, Wyo., assignors to Park Energy Company, Jackson, Wyo.

Filed Jul. 20, 1979, Ser. No. 59,262

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—450 **14 Claims**



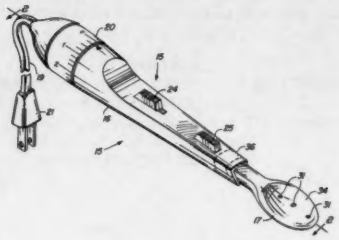
1. In a solar heat collector assembly having a peripheral frame, radiant energy collector means mounted in said frame, and a radiant energy transparent cover having first and second spaced ends and overlying said collector means, the improvement comprising means to permit expansion and contraction in end to end dimension of said cover member comprising means to retain said cover member from end to end sliding movement relative to said frame at location spaced from one of said first and second ends of said cover member to permit substantially unrestrained thermally induced variation along the major parts of the end to end dimension of the cover, means mounted on the frame and spaced from the one end to slidably support said cover member for substantially unrestrained sliding movement relative to said frame, and sealing means extending between at least the one end of said cover and said frame to form a weather seal between said cover member and said frame to permit shifting of the one end of said cover member relative to the frame while the sealing means remain sealed.

4,291,685

THERAPEUTIC HEAT AND COSMETIC APPLICATOR

Dennis L. Taelman, 6200 S. 30th St., Phoenix, Ariz. 85040

Filed Jun. 15, 1979, Ser. No. 49,041
Int. Cl.³ A61H 1/00, 23/02
U.S. Cl. 128—24.1 4 Claims



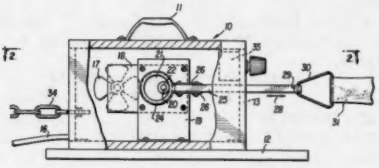
1. A therapeutic hand-held electrical applicator for facial treatment comprising:
a hollow elongated tubular handle,
a hollow heat applying element mounted at one end of said handle,
an electrical means comprising a rheostat mounted within said handle and a heating means mounted within said element,
said rheostat selectively controlling the electric current flowing through said heating means for heating said element,
a material dispensing means mounted within said handle,
at least one opening in said element,
conduit means connecting said material dispensing means with said opening, and
control means on the exterior of said handle for selectively controlling said electrical means and said material dispensing means,
said control means comprising a sleeve mounted for rotatable movement around the outer periphery of said handle for controlling said rheostat and a switch for selectively actuating said material dispensing means,
a vibrator means mounted within said handle for vibrating said heat applying element,
said vibrator means comprising a piezoelectric transducer having a sleeve mounted around the outer periphery of said handle adjacent said heat applying element; and
said control means actuating said vibrator means.

4,291,686

BACK AND SPINE EXERCISER

David J. Miyashiro, 733 Mililani St., Hilo, Hi. 96720

Filed Jan. 14, 1980, Ser. No. 111,697
Int. Cl.³ A61H 7/00
U.S. Cl. 128—52 6 Claims



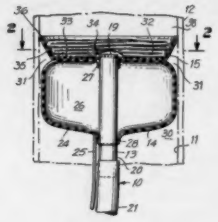
1. A method of exercising the back and spine of a person, comprising the application to the spine of a gentle, slow cyclical action of alternate periods of tension and relaxation of the tension, by applying a harness to the head and chin of the user, and applying symmetrical and cyclic reciprocating motion of small amplitude having a 360° substantially sinusoidal waveform when plotted against time, and of slow period to said harness substantially along a line parallel to the axis of the spine.

4,291,687

INFLATABLE PACKING FOR SURGICAL USE HAVING AUXILIARY INTESTINAL SUPPORTING MEMBER

Manfred Sinnreich, 160 Ft. Hill Rd., Scarsdale, N.Y. 10583

Continuation of Ser. No. 82,793, Mar. 2, 1978, abandoned. This application Feb. 8, 1980, Ser. No. 119,947
Int. Cl.³ A61F 5/46; A61M 27/00
U.S. Cl. 128—129 1 Claim



1. In an inflatable surgical packing for use in supporting the intestines of a patient following a hysterectomy or exenteration procedure, said packing having an inflatable element having an inner end surface, said inflatable element adapted to conform and substantially fill a surgical cavity formed by said procedure, said inflatable element having a principal axis and drainage means substantially aligned with said axis and projecting therethrough, the improvement comprising: an arcuate cupped support element lying generally transversely with respect to said axis and secured at a central area thereof to said inner end surface to surround said drainage means; said support element including a generally planar circular centrally disposed portion having a centrally positioned opening, said opening having an edge surrounding an open end of said drainage means, said portion being supported directly by said inflatable element, and a frusto-conical peripheral portion flaring in a direction away from said open end of said drainage means and having a free edge, said edge, when unstressed, extending outwardly of the maximum lateral excursion of said inflatable element, said open end of said drainage means being located within said frusto-conical peripheral portion whereby upon the filling of said cavity by said inflatable element and the forming of an arcuate interstice at an inner peripheral end thereof with said cavity, said support element may overlie said interstice to be spread thereover by contact with otherwise unsupported intestinal tissue to overlie said interstice and prevent the pinching of such tissue.

4,291,688

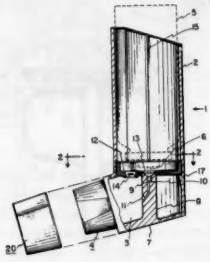
INHALATION DEVICE

Frederic E. Kistler, Horw, Switzerland, assignor to Schering Corp., Kenilworth, N.J.

Filed Dec. 17, 1979, Ser. No. 104,610
Claims priority, application European Pat. Off., Jan. 11, 1979, 79810001.2; Oct. 25, 1979, 79810138.2
Int. Cl.³ A61M 15/00
U.S. Cl. 128—200.23 15 Claims

1. An inhalation device of the type adapted to receive and locate an aerosol container designed to administer a multiplicity of metered doses, said aerosol container having a composition under pressure therein and having metering valve means including a valve stem and associated metering means, the valve stem having an axial discharge tube extending therethrough for discharge of a metered dose upon actuation of said metering valve means by depression of said valve stem, said inhalation device comprising a body having a skirt adapted to

receive and locate said aerosol container in a first end thereof and a head-piece connected to a second end of said skirt, a mouth-piece extending from said head-piece and in communication therewith, and an audible signal generating means, said head-piece having actuating means for said metering valve means and a discharge passageway leading to a discharge orifice directed towards said mouth-piece, said actuating means being engageable with the valve stem upon locating of the container within the skirt and operable to actuate the metering valve means whereby a metered dose is discharged through the valve stem discharge tube and the discharge passageway and discharge orifice into the mouth-piece, an air-passageway extending through at least part of said body from a location at least upstream of said actuating means to said mouth-piece and providing a path for air to flow from the ambient into the mouth-piece upon inhalation through the mouth piece, wherein said audible signal generating means is located in said air-passageway within the body upstream of said discharge orifice and surrounds the actuating means for the metering valve means, and is actuatable upon inhalation through said mouth-piece when said inhalation device is in engagement with said container.

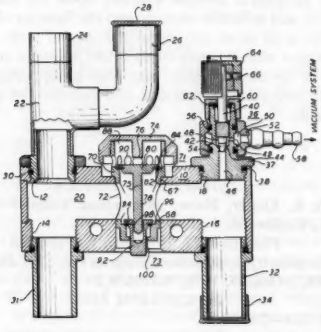


4,291,689

EVACUATION MANIFOLD FOR MEDICAL ANESTHESIA CIRCUITS

Wayne W. Hay, Madison, Wis., assignor to Airco, Inc., Montvale, N.J.

Filed Oct. 19, 1979, Ser. No. 86,962
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.24 **4 Claims**



1. An anesthetic gas evacuation manifold, said manifold having an inlet for receiving exhaust anesthetic gases and an outlet for discharging said gases to a vacuum collection system, said manifold having a positive pressure relief valve and a negative pressure pressure relief valve, said positive pressure relief valve having a first valve seat and a first normally closed movable valve member, said first movable member adapted to move from said first valve seat when a predetermined positive pressure occurs within said manifold, said negative pressure relief valve having a second valve seat and a second normally closed movable valve member, said second movable valve member adapted to move from said second valve seat when a predetermined negative pressure occurs within said manifold and means external of said manifold to simultaneously manually move said first and second movable valve members, respectively, from said first and second valve seats.

4,291,690

MEANS FOR PERFORMING AN EMERGENCY CRICOTHYROTOMY

John W. Jessen, 421 Keeney, Evanston, Ill. 60202

Filed Mar. 21, 1979, Ser. No. 22,424
Int. Cl.³ A61B *17/32*; A61M *16/00*
U.S. Cl. 128—200.26 **9 Claims**

1. An emergency cricothyrotomy trocar assembly enclosed within a functional capsular package, said assembly comprising stylet means having a short fluted shaft terminating in a lancet having at least one elongated cutting knife edge, a straight and unobstructed tube means surrounding said shaft and forming a cannula removably mounted on and deployed by said stylet cutting and penetrating the skin of a throat and a cricothyroid membranne while passing into a trachea, the flutes forming an immediate air passage during insertion while the stylet is still in the cannula, and means on said stylet and cannula for flaring the intratracheal end of the cannula to provide a self-retention means for securing the cannula within the trachea after said stylet is completely withdrawn from said cannula.

4,291,691

COMBINED RESPIRATOR AND CATHETER SUCTION ADAPTER

Luis A. Cabal, Pasadena, Calif., and Carmelo P. Dali, Chesire, Conn., assignors to Novametrix Medical Systems, Inc., Wallingford, Conn.

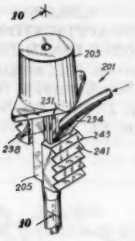
Filed Oct. 30, 1978, Ser. No. 955,514
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—204.18 **18 Claims**

1. An adapter for removably connecting a tube to a respirator comprising:

a substantially straight elongated body having first and second open ends, means on said first end adapted to be connected to said respirator, means on aid second end adapted to be connected to said tube, said body having a sole, substantially straight hollow, unobstructed axial bore extending between said ends, an access opening, and an inclined bore communicating between said access opening

and said axial bore whereby a catheter can be inserted through said access opening into said axial bore, and

access closure means comprising a member adapted to be gripped by one or more fingers of a user, movably mounted on the periphery of said body for limited movement between a position covering said access opening and



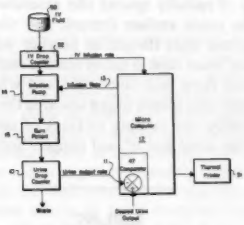
a position proximately adjacent to yet exposing said access opening, said body further including means disposed between said ends for positively preventing inadvertent movement of said closure means further away from said covering position than said proximately adjacent position when said access closure means is moved to said exposing position.

4,291,692

CLOSED-LOOP INFUSION SYSTEM, BOTH METHOD AND APPARATUS, BASED ON REAL TIME URINE MEASUREMENT

Robert J. Bowman, and Dwayne R. Westenskow, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Oct. 9, 1979, Ser. No. 83,027
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 E **22 Claims**



1. A closed loop system for controlled infusion of fluids, medication and diagnostic substances based on real time measurement of urine output of a patient, comprising:

(a) a urine drop counter including

(i) a drop chamber,

(ii) means for successively sensing occurrences of drops of urine within said drop chamber,

(iii) inlet means having an opening size and configuration adapted to form drops of substantially uniform volume,

(iv) means to compensate for drop volume variation with variation in urine flow rate; and

(v) outlet means adapted for conducting urine from said chamber to a collection site;

(b) a small diameter tube connected at one end to said inlet means and adapted in length and configuration for connection at the other end to a bladder catheter to be associated with the patient, the catheter/tube combination including means to prevent rate of urine flow within said tube from exceeding rate of urine production by a patient's renal system;

(c) comparator means coupled to said drop sensing means to provide monitoring of real time flow rate of said urine based on frequency of drop occurrence and to compare said real time flow rate with a predetermined flow rate selected for the patient, said comparator means including means to provide an error signal output corresponding to a variance detected between the real time and predetermined flow rates;

(d) regulated infusion means adapted for automatically introducing said fluids, medications and diagnostic substances within said patient at variable infusion rates; and

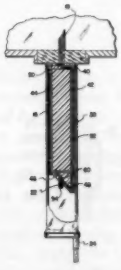
(e) computer means coupled to (i) the error signal output of the comparator means and (ii) the regulated infusion means, for processing said error signal and for providing an appropriate correction signal to said infusion means for adjusting infusion rates to thereby increase or decrease patient fluid levels or concentrations of medication or diagnostic substances until a null reading is obtained at the comparator based on changes in urine output.

4,291,693

FLUID METERING DEVICE

Robert J. Todd, and Terry M. Wonder, both of Salt Lake City, Utah, assignors to Sorenson Research Company, Inc., Salt Lake City, Utah

Filed Nov. 13, 1979, Ser. No. 93,422
Int. Cl.³ A61M *5/16*
U.S. Cl. 128—214 C **22 Claims**



1. A fluid metering device comprising:

a drip chamber;

a primary fluid channel in fluid communication with a fluid source;

a secondary fluid channel vented into said drip chamber and connected at one end thereof to said primary fluid channel so as to be in fluid communication therewith; and

a drip generator, said drip generator comprising (1) a fixed resistor means in fluid communication with said primary fluid channel, said fixed resistor means being situated so as to cause the fluid flowing therethrough to flow essentially upwardly through said resistor means, and (2) a drip forming means in series with said fixed resistor means, whereby the level of fluid in said secondary fluid channel will vary in proportion to the rate of fluid flow through said drip generator.

4,291,694

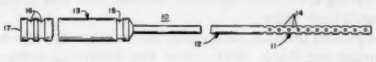
APPARATUS AND METHOD FOR PERFORMING A THORACIC OPERATION

S. Chai, 187 Bolivar La., Portola Valley, Calif. 94025

Filed Oct. 29, 1979, Ser. No. 89,221
Int. Cl.³ D61M *5/00*
U.S. Cl. 128—214.4 **12 Claims**

1. In a kit of instruments adapted for use in performing a percutaneous thoracic operation on a patient, a hollow needle

having one end adapted to be inserted into said patient through the chest wall, between a pair of ribs, and into the pleural cavity; and a hollow tube having a distal portion and a proximal portion, said proximal portion having at least one aperture therein and being adapted to be inserted through said hollow needle into said pleural cavity, said distal portion having at least one aperture therein and being adapted to be connected to



means for evacuating fluid from said pleural cavity of said patient through said hollow tube, said distal portion of said hollow needle being adapted to receive a section of said distal portion of said hollow tube, and a first means carried on an interior surface of said distal portion of said hollow needle and a second means carried on an exterior surface of said section of said hollow tube being adapted to lock said hollow needle and said hollow tube together.

4,291,695

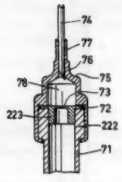
DISPOSABLE INJECTION SYRINGE

Hendrik M. Bekkering, Olst, and Ernst M. Schmidt, Eindhoven, both of Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Continuation of Ser. No. 929,167, Jul. 28, 1978, abandoned, which is a continuation of Ser. No. 783,943, Apr. 1, 1977, abandoned. This application May 2, 1980, Ser. No. 146,152

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—218 NV **5 Claims**



1. A disposable syringe comprising:

a cylindrical body having a constant internal diameter throughout its length, connecting means on the outer portion of the cylindrical body adjacent the forward end thereof;

a needle hub assembly affixed to the forward end of the cylindrical body, said needle hub assembly including a hub portion having locking means coacting with the connecting means on the forward end of the cylindrical body to retain the needle hub assembly on the forward end of the cylindrical body, said hub portion including a needle mounting portion extending forwardly from the forward end of the cylindrical body, the inner diameter of the needle mounting portion adjacent the forward end opening of the cylindrical body having a diameter at least as large as that of the inner diameter of the cylindrical body to form a hub chamber, said needle mounting portion having a forward section adapted to receive an injection needle;

a rupturable sealing member closing off the forward end of the cylindrical body; plunger means sealingly and slidably positioned in the cylindrical body adjacent the rearward end thereof to form a medicament chamber between the plunger means and the sealing member; and

a finger grip affixed to the rearward end of the cylindrical body, the sealing member being sufficiently flexible whereby the pressure developed by forward movement of the plunger means will rupture said sealing member and commence the flow of the medicament into the hub chamber and out of the needle and wherein continued forward movement of the plunger means will result in travel thereof into the hub chamber to fully inject the major portion of the medicament carried by the medicament chamber.

4,291,696

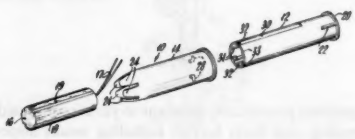
COMPACT TAMPON-APPLICATOR ASSEMBLY WITH RIBBED INNER TUBE

David F. Ring, Morganville, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Sep. 27, 1979, Ser. No. 79,612

Int. Cl.³ A61F *15/00*

U.S. Cl. 128—263 **4 Claims**



1. In a tampon applicator assembly having a proximal end, a distal end, and comprising a generally cylindrical outer tube; a generally cylindrical inner tube having an outside diameter less than the inside diameter of said outer tube, said inner tube being snugly nested, coaxially within said outer tube;

a tampon enclosed coaxially within said inner tube;

a gripping portion affixed to the distal end of said inner tube and extending out of the distal end of said outer tube for gripping said inner tube and reciprocating said tube almost completely out of said distal end of said outer tube;

and at least one restraining element in the distal half of the outer tube for restraining said tampon from reciprocating with said inner tube so that the tampon will remain enclosed by said outer tube when said inner tube is reciprocated;

the improvement wherein said inner tube is provided with a plurality of radially spaced ribs extending longitudinally along the inside surface thereof, said ribs terminating at the proximal ends thereof in bearing surfaces; whereby when said inner tube is reciprocated, said tampon will be transferred from said outer tube and when said reciprocated inner tube is then urged towards the proximal end of the assembly, the bearing surfaces of said ribs will bear against the distal end of said tampon and expel said tampon.

4,291,697

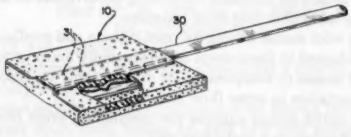
CLEANING AND APPLICATION DEVICE FOR MEDICAL PURPOSES

Stephen Georgevich, 4741 Royce Rd., Irvine, Calif. 92715

Filed Apr. 18, 1980, Ser. No. 141,416

Int. Cl.³ A61M *35/00*

U.S. Cl. 128—269 **13 Claims**



1. A sterilizable, cleaning device for medical purposes, comprising:

(a) a sponge element;

(b) a pouch disposed within the sponge, the pouch containing cleaning or antiseptic liquids, the sponge being edge

sealed along at least one side to completely encapsulate the pouch therein, the pouch comprising:

i. a rupturable film selected from the class consisting of plastic, plastic laminate, and a laminate of aluminum and plastic,

ii. the pouch bearing one or more weakening lines thereon adapted to be ruptured under pressure; and

(c) a handle defining two ends and a medial area, a portion of the medial area being sealed within the sponge, and adjacent the pouch, whereby pressure on the sponge and handle ruptures the weakening lines, thereby releasing the liquid from the pouch, a portion of liquid being absorbed by the sponge, the remaining liquid passing outwardly through the sponge and along its surface, and pressure on the sponge while scrubbing forces absorbed liquid to the sponge surface to provide a continuing supply of liquid on the sponge surface for application thereof.

4,291,698

BUTTON FOR SURGICAL APPLICATIONS

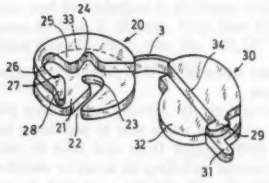
Heinz Fuchs, deceased, late of Melsungen, Fed. Rep. of Germany (by Hedwig Fuchs, heir); Hans-Friedrich Müller, Hamburg, and Hildegard Hecht, Spangenberg, both of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Nov. 28, 1979, Ser. No. 98,184

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1978, 2853289

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—335 **10 Claims**



1. A button for surgical applications comprising a disk having a parallel-walled housing, a slot which extends to a thread passage for guiding a thread therethrough within the circumference of the disk, the thread passage and the slot being in one housing wall, the other housing wall being recessed past the passage, said passage being closeable by a clamping means for clamping the thread firmly in the passage, with the clamping means including a disk segment rotatably joined to and movable parallel with the disk over the slot and thread passage to a latched position where its inner marginal part is past the thread passage, and in the latched position the disk segment inner marginal part protrudes into a cavity past an edge of the disk recessed housing wall and a disk segment recessed edge behind the inner marginal part is adjacent said edge of the disk recessed housing wall.

4,291,699

METHOD OF AND APPARATUS FOR AUTOMATICALLY DETECTING AND TREATING VENTRICULAR FIBRILLATION

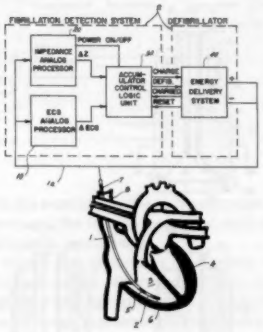
Leslie A. Geddes; Joe D. Bourland, both of West Lafayette, Ind., and Reese S. Terry, Freeport, Tex., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Sep. 21, 1978, Ser. No. 944,369

Int. Cl.³ A61N *1/36*

U.S. Cl. 178—419 D **23 Claims**

1. An automatic cardiac ventricular defibrillator comprising: means for sensing electrical and mechanical activity of a cardiac ventricle in the form of ECG analog signals and the impedance of the ventricle, an ECG analog processor for producing an ECG analog processor signal of a fibrillatory condition, means for communicating the sensed electrical activity to said ECG analog processor, accumulator-control-logic means for counting fibrillatory signals, means for communicating an ECG analog processor signal of a fibrillatory condition from said ECG analog processor to said accumulator-control-logic means, an impedance analog processor operatively connected to said sensing means and responsive to said accumulator-control-logic means and for developing a signal of a non-fibrillatory condition which effects a decrementing count, means for communicating an activation switching action to said impedance analog processor responsively to a predetermined number of counted fibrillatory signals to selectively activate said impedance analog processor, means for communicating impedance measurement of the ventricle to said impedance analog processor, means for communicating an impedance analog processor derived signal of a non-fibrillatory condition to said accumulator-control-logic means while the impedance analog processor is activated, said accumulator-control-logic means being thereafter simultaneously responsive to both ECG analog processor and impedance analog processor signals, and an energy delivery system responsive to said accumulator-control-logic means to effect a defibrillating electrical shock to the heart appropriate to the correction of a fibrillatory heart condition.



4,291,700

Patent Not Issued For This Number

4,291,701

PRESSURE TRANSDUCING AND METHODS AND APPARATUS FOR FILLING A CAVITY

Ronald Bowman, Laguna Beach, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jul. 11, 1978, Ser. No. 923,600

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—675 **28 Claims**

1. A method of filling a cavity and a port extending for a distance from said cavity with a liquid through a hypodermic

needle longer than said distance, while permitting gas and excess liquid to escape, comprising in combination the steps of:

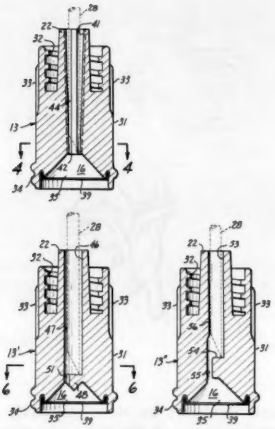
providing said port with a straight passage leading to said cavity;

partially inserting said needle into said straight passage of said port;

stopping said partially inserted needle by engagement inside said port short of said cavity while providing an overflow and gas escape path throughout said straight passage along the outside of said stopped partially inserted needle;

injecting liquid through said needle into said cavity while preserving said overflow and gas escape path; and

withdrawing said needle from said port while continuing to



inject liquid through said needle until said port is filled with said liquid.

7. An apparatus having a port and a cavity for receiving a liquid from a hypodermic needle through said port, comprising in combination:

a straight passage in said port leading to said cavity for receiving part of said needle;

means in said port for engaging said needle inside said port and stopping said needle short of said cavity; and

means in said port for providing an overflow and gas escape path throughout said straight passage.

13. A dome for a pressure transducer having a port, a cavity for receiving a liquid from a hypodermic needle through said port, and an opening for a transduction of pressure variations relative to said cavity, comprising in combination:

an isolation membrane closing said opening for said liquid;

a straight passage in said port leading to said cavity for receiving part of said needle;

means in said port for engaging said needle inside said port and stopping said needle short of said cavity; and

means in said port for providing an overflow and gas escape path throughout said straight passage.

4,291,702

CATHETER FLUSHING APPARATUS

James E. Cole, and Peter Thornton, both of Ventura, Calif., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 25, 1979, Ser. No. 52,019

Int. Cl.[3] A61B *5/02*

U.S. Cl. 128—675 **8 Claims**

1. An improved flow control apparatus for use in liquid flow systems for pressure monitoring of hemodynamics, such systems including a catheter which is continuously flushed in use, said apparatus comprising:

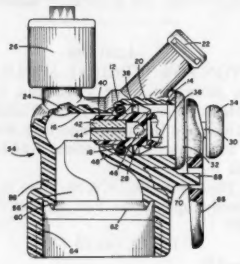
a housing having at least one passage therein, said passage having an inlet and an outlet;

a valve seat defined in said passage;

a valve plunger movably mounted in said passage;

resilient means biasing said plunger into contact with said seat;

capillary means extending at least partially through said plunger for providing a low flow path from said inlet to



said outlet when said valve plunger is in contact with said valve seat;

means for selectively moving said valve plunger out of contact with said valve seat to provide a high flow path around said plunger from said inlet to said outlet, said moving means including an actuator member attached to said plunger and slidably mounted in and extending through a hole extending from said passage to the exterior of said housing so that said plunger may be moved selectively out of contact with said seat by manipulation of said actuator member from externally of said housing; and

a flexible sealing element connected about said actuator member and to said housing about said hole to prevent liquid from leaking out of said passage through said hole.

4,291,703

PACEMAKER MONITORING RECORDER

George J. Kelen, Staten Island, N.Y., assignor to Del Mar Avionics, Irvine, Calif.

Division of Ser. No. 956,878, Nov. 1, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 106,692

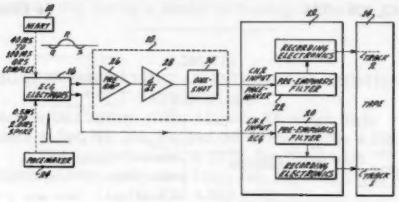
Int. Cl.[3] A61B *5/04*

U.S. Cl. 128—711 **5 Claims**

1. In a magnetic tape recorder for recording signals indicative of the operation of a pacemaker and of the response of a patient to the pacemaker as revealed by the time relationship between a pacemaker spike signal generated by the pacemaker and an ECG generated by the patient equipped with the pacemaker, said magnetic tape recorder having at least two channels for recording separate tracks on a magnetic tape, each

channel including a pre-emphasis filter, at least a pair of ECG electrodes to be connected to the patient for receiving said pacemaker spike signal and said ECG signal;

first means for sensing the occurrence of a pacemaker spike signal, said pacemaker spike signal having a frequency spectrum higher than the frequency spectrum required to pass the ECG signal, and for producing in response to the



pacemaker spike signal a synthesized signal whose frequency spectrum lies within the frequency spectrum required to pass the ECG signal; and

second means for separating and recording the synthesized signal and the ECG signal through respective ones of said channels on separate tracks on magnetic tape, whereby the synthesized signal is recorded by a recorder normally used for recording ECG signals.

4,291,704

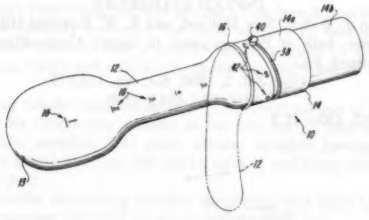
SPIROMETER DEVICE

Thomas L. Petty, and Balinderjeet S. Baidwan, both of Denver, Colo., assignors to Dale E. Braddy, Oak Row Village, Ill.

Filed Dec. 13, 1979, Ser. No. 103,237

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—728 **4 Claims**



1. A spirometer device comprising, in combination:

an inflatable elastomeric vessel having one open end and calibration indicia for indicating the volume of air contained in the vessel, and

a main body releasably attached to said vessel at said open end in fluid communication with the interior of said vessel, said main body having two relatively rotatable sections of generally hollow tubular construction, one of said sections having a partition with a hole therethrough wherein said partition extends generally transversely of said tubular main body, the other of said sections having a flexible sealing membrane with an opening therethrough positioned adjacent and parallel to said partition on the vessel side of said partition, so that said membrane can be rotated relative to said partition to selectively align the misalign said hole and said opening, whereby when said hole and opening are aligned, air can be directed through said main body into said vessel, and, when the hole and opening are misaligned, air can be sealed in said vessel, said main body further including an air actuated, audible sound generating element secured therein in alignment with at least a portion of said hole in the partition so that air escaping from said vessel through said hole can be directed through said element to produce an audible sound.

4,291,705

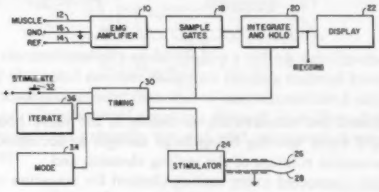
NEUROMUSCULAR BLOCK MONITOR

John W. Severinghaus, Ross, and Edwin M. Severinghaus, Corte Madera, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 10, 1979, Ser. No. 73,889

Int. Cl.³ A61B *5/05*

U.S. Cl. 128—733 **9 Claims**



1. Apparatus for monitoring the neuromuscular transmission of a motor nerve and the muscle associated with the nerve in a patient, the apparatus comprising

stimulator means for generating a plurality of electrical stimulus signals which are spaced apart by predetermined periods of time and for applying such stimulus signals to the motor nerve to supramaximally stimulate it,

amplifier and detector means connected to the stimulator means, and including a pair of sensing electrodes adapted to be attached to the patient, for sensing the electromyogram (EMG) produced by the associated muscle as a result of the stimulating electrical signals and for amplifying the EMG,

electronic integrator means connected to the amplifier and detector means for receiving each amplified EMG in response to each stimulus signal and for integrating it with respect to time over periods which fall between stimulus signals,

control standard means connected to the integrator means for storing a representation of a first integrated EMG,

comparator means connected to the integrator means for generating an output signal which is representative of the ratio of a select, integrated EMG and the first, integrated EMG, and

means for displaying the output signal of the comparator means.

4,291,706

VALVE FOR CLOSING A PLURALITY OF CONTAINER OUTLETS SIMULTANEOUSLY

Karl-Friedrich Voges, Melsungen, and Gerd Herlitze, Baunatal, both of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Sep. 12, 1979, Ser. No. 75,131

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 7828577[U]

Int. Cl.³ F16K *11/02*

U.S. Cl. 128—762 **3 Claims**

1. A urine measuring apparatus containing a valve for simultaneously closing the outlets of a plurality of urine-receiving chambers in communication with the valve to stop flow of urine from the chambers,

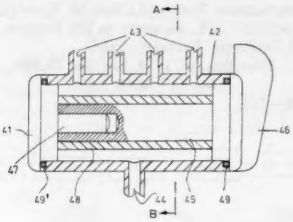
said valve including a housing having a plurality of aligned and spaced apart inlet openings corresponding in number to the number of chamber outlets to be sealed, and at least one outlet from the housing;

a sealing element adjustably positioned in the valve housing for simultaneously sealing all of the valve housing inlets so

as to seal off liquid communication between the chambers themselves, and between the chambers and the chambers exteriors,

the sealing element including a body eccentrically positioned and eccentrically pivotable in the valve housing, said valve housing being large enough to accommodate eccentric rotation of the sealing element, and

means connected to the sealing element for actuation of the sealing element exterior of the valve housing.

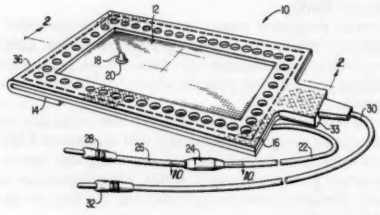


4,291,707

IMPLANTABLE CARDIAC DEFIBRILLATING ELECTRODE

Marlin S. Heilman, Gibsonia, and Alois A. Langer, Pittsburgh, both of Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Apr. 30, 1979, Ser. No. 34,730
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—784 **21 Claims**



1. An implantable cardioverting electrode assembly for placement proximate the heart and for connection to a suitable cardioverting system, the assembly comprising:

a flexible electrically conductive planar electrode means for placement proximate the heart, said electrode means having an electrically conductive margin defining the outer perimeter of said electrode means and at least one exposed conducting area surrounded by said margin,

an electrical insulating element covering the surface of said planar electrode facing away from the heart,

electrical conductor means arranged to electrically connect said electrode means and said cardioverting system, and

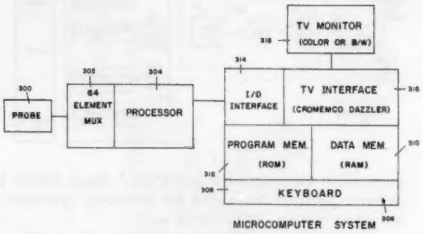
a layer of electrical insulation material arranged on a conductive surface of said margin of said electrode means, which conductive surface is proximate the heart, said layer having at least one open central area to permit the central portion of said electrode means to be exposed and substantially covering the margin of said electrode means, said insulation material having a plurality of small apertures therein located about said margin of said electrode means for also exposing the electrode surface therethrough, whereby said plurality of small apertures substantially eliminates edge effect current concentrations.

4,291,708

APPARATUS AND METHOD FOR DETECTION OF TUMORS IN TISSUE

Ephraim H. Frei, and Bruce D. Sollish, both of Rehovot, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Nov. 2, 1978, Ser. No. 956,926
Claims priority, application Israel, Nov. 2, 1977, 53286
Int. Cl.³ A61B *5/05*
U.S. Cl. 128—734 **16 Claims**



1. Apparatus for detecting tumors in living human breast tissue comprising:

means for determining the dielectric constants of a plurality of localized regions of living human breast tissue including a bridge means having means for automatically nulling said brigde means while in operation; and

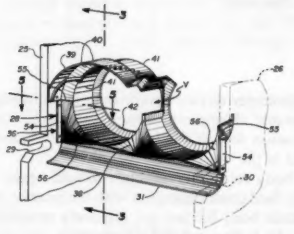
means for measuring variations in said dielectric constants over a plurality of said regions and for indicating the possible presence of a tumor as a result of said measurement.

4,291,709

INFEED GEOMETRY

Steven J. Weber, New Holland, and E. W. Rowland-Hill, Lancaster, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Jul. 2, 1980, Ser. No. 165,173
Int. Cl.³ A01F *7/06*
U.S. Cl. 130—27 T **3 Claims**



1. In a rotary combine having at least one elongate generally cylindrical threshing chamber therein with a first end and an opposing second end defining a working surface at least partially corresponding to the interior surface thereof, at least one elongate generally cylindrical threshing rotor mounted within the chamber for rotation relative thereto about the longitudinal axis thereof, the rotor having an infeed auger adjacent infeed means at the first end of the threshing chamber, the diameters of the threshing chamber and the rotor being of such a relationship so as to form a cavity therebetween into which crop material may be fed for threshing and grain separation, a crop thinning chamber between the infeed means and the threshing chamber, the improvement comprising:

(a) the auger being generally tapered so that the surface of rotation defines a frustrum with the base being oriented toward the infeed means and,

(b) the crop thinning chamber defining a series of steps including a first step having an arcuate constant diameter segment, a second step having an arcuate decreasing diameter segment, said first and second steps being diametrically opposite a plurality of angled infeed ramps, a third step having a tubular constant diameter segment and a fourth step having a tubular decreasing diameter segment.

4,291,710

CIGARETTES HAVING AN INDIVIDUAL LIGHTING STRUCTURE

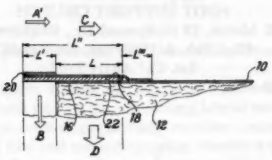
Francesco De Capitani, Corso Magenta 83, Milan, Italy

Division of Ser. No. 760,768, Jan. 10, 1977, Pat. No. 4,178,945. This application Jul. 6, 1979, Ser. No. 55,634

Claims priority, application Italy, Jan. 26, 1976, 19580 A/76

Int. Cl.³ A24D *1/08*

U.S. Cl. 131—351 **7 Claims**



1. In a tobacco article, such as a cigarette, a small cigar and the like, having on an outer end thereof an individual lighting means, the improvement wherein said lighting means comprises:

an inner tubular member having a first length portion surrounding said outer end of said tobacco article;

a tubular supporting member having a first length portion at least partially covering the outer surface of said inner tubular member and a second length portion in direct contact with and adhesively applied to said tobacco article;

an outer tubular member applied to the outer surface of said tubular supporting member at the fore end of said inner tubular member, said outer tubular member having an axial length less than the axial length of said inner tubular member;

said tubular supporting member supporting said inner tubular member and said outer tubular member; and

said outer tubular member being formed of a first material that can be ignited by rubbing and that allows for quick spreading of flame, and said inner tubular member being formed of a second material that can be easily ignited by said first material and that can be charred and converted into embers surrounding and capable of igniting said outer end of said tobacco article.

4,291,711

TOBACCO SMOKE FILTER PROVIDING TOBACCO FLAVOR ENRICHMENT, AND METHOD FOR PRODUCING SAME

Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.

Filed Mar. 27, 1979, Ser. No. 24,251

Int. Cl.³ A24D *3/02, 3/06*

U.S. Cl. 131—336 **14 Claims**

1. A smoke filter means including a filter element comprising a self-sustaining dimensionally stable axially elongated reconstituted tobacco member comprising a coherent sheet of reconstituted tobacco compacted and bonded together into a rod-like body, said reconstituted tobacco sheet being uniformly embossed with a series of parallel grooves extending longitudinally with respect to said reconstituted tobacco member so as to provide said reconstituted tobacco member with flow passages having a high surface area for contact with smoke passing therethrough and thereby enabling said smoke to become tobacco flavor-enriched by extracting tobacco flavor from the reconstituted tobacco, said reconstituted tobacco member

being circumferentially enveloped by a hollow annular-shaped axially elongated member of fibrous filtering material having a draw resistance greater than that of said reconstituted tobacco member, whereby smoke passing through said filter element will be directed primarily through said reconstituted tobacco member.

4,291,712

CIGARETTE FILTER AND FILTER CIGARETTE

Hendrikus J. Koster, Koude kerk a/d Rijn; Johannes T. J. Bik; Johannes G. Clardey, both of Rijswijk, and Dirk Smorenberg, Berkel Roodenrijs, all of Netherlands, assignors to Sigarettenfabriek Ed. Laurens B.V., The Hague, Netherlands

Filed Nov. 9, 1978, Ser. No. 959,173

Claims priority, application Netherlands, Nov. 11, 1977, 7712441

Int. Cl.³ A24D *3/02, 3/04;* A24C *5/52*

U.S. Cl. 131—339 **8 Claims**

4. A cigarette filter comprising a body of fibrous material enclosed in a wrapping material, said fibrous material having one or more axial channels therethrough with a hardened inner channel wall resulting from the melting of the filter material by producing the filter by laser means.

4,291,713

DEVICE FOR HEATING THE SEAMS OF WRAPPERS FOR ROD-LIKE FILLERS IN CIGARETTE MAKING MACHINES OR THE LIKE

Willi Frank, Hohnsdorf, Fed. Rep. of Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jan. 18, 1978, Ser. No. 870,605

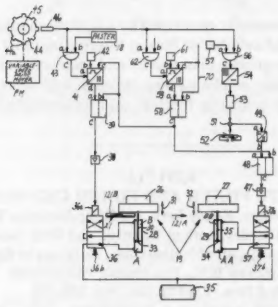
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703288

Int. Cl.³ A24C *5/24*

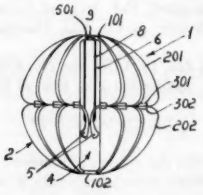
U.S. Cl. 131—68 **5 Claims**

1. In a machine for the making of wrapped rod-like fillers of tobacco and/or filter material wherein a web of wrapping material is draped around the filler so that the marginal portions of the web overlap each other, the combination of means for transporting the filler and the web at a variable speed lengthwise in a predetermined direction along a predetermined path; paster means operable to apply adhesive to at least one marginal portion of the web in a first portion of said path; means for folding the marginal portions of the web over each other in a second portion of said path downstream of said first portion, as considered in said direction, to thus convert the web into a tubular wrapper which surrounds the filler and

wherein the marginal portions and the adhesive form a seam extending lengthwise of the resulting wrapper; adjustable means for heating the adhesive of said seam in a third portion of said path downstream of said second portion, including first and second seam heating elements located one behind the other, as considered in said direction, said elements being movable into and from engagement with successive increments of the seam in said third portion of said path; means for adjusting said heating means stepwise as a function of changes in the speed of said filler so that the seam is subjected to a less pronounced heating action at a lower speed and to a more pronounced heating action at a higher speed of the filler, including discrete first and second moving means for said first and second seam heating elements, means for monitoring the speed of the filter, first operating means for operating said first moving means during and subsequent to acceleration of the filler to a predetermined speed so as to move said first element into engagement with the seam, and second operating means for operating said second moving means on acceleration of said filler to said predetermined speed so as to move said second element into engagement with the seam; and variable-speed prime mover means, said second operating means including means for monitoring the speed of said prime mover means and for initiating the operation of said second moving means when said variable-speed prime mover means completes the acceleration of the filler to said predetermined speed.



4,291,714
HAIR CURLER
Rodolfo Mariani, 27, Corso Saffi, Faenza, Italy
Filed Feb. 1, 1980, Ser. No. 117,713
Int. Cl.[3] A45D *2/00*
U.S. Cl. 132—40 **7 Claims**



1. A hair curler for the curling treatment of a hair lock, comprising:

(a) an axial core having clamping means at one of its ends for clamping said hair lock at its base portion;

(b) hair lock engaging and guide means arranged for rotation around said axial core;

(c) a cage-like element at least partly surrounding said axial core, thus defining an annular chamber for receiving said hair lock curled around said axial core, following rotation of said hair lock engaging and guide means;

(d) said cage-like element comprising two hollow hemispheres each having a polar cap and being rotatably connected to one another to define a substantially spherical cage, said axial core being contained within said cage and rotatably joining by its ends said polar caps of said hemispheres, each of said hemispheres having a side opening having two edges extending along meridional lines and angularly spaced from one another, so that the edges of the opening in one hemisphere can be aligned, by relative rotation of said hemispheres, with the edges of the opening in said other hemisphere, thus defining a crescent shaped opening, the opening of the hemisphere opposite the end of said axial core carrying said clamping means being closed by resilient closure members which can be opened towards the interior of said cage, said opening with said closure members defining said hair lock engaging and guide means.

4,291,715
FOOT SUPPORT CRUTCH
Woodrow S. Monte, 19 Hollywood Dr., Bricktown, N.J. 08723
Filed Feb. 4, 1980, Ser. No. 118,487
Int. Cl.[3] A61H *3/02*
U.S. Cl. 135—68 **11 Claims**

1. A lower leg or foot crutch comprising a ground contact member adapted for receiving downwardly applied forces and for transmitting any said applied forces to the ground at a point effectively in line with said applied forces,

an intermediate support device having an upper end and a lower end, said lower end connected to said ground contact member and adapted for transmitting forces to said ground contact member through said connection,

an upper body stabilizing member having uper and lower ends, said upper end adapted for positioning against a users body, and said lower end connected to said intermediate support device at a position between said lower and upper ends of said intermediate support device, and

a leg support member for engaging the leg of a user below the knee thereof, and for accepting downwardly applied forces from said user, said leg support member attached exclusively to said upper end of said intermediate support device for transmitting any said accepted forces directly to said intermedite support device.

4,291,716
PILOT STAGE VALVE
Dwayne R. Elmberg, Golden Valley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 13, 1977, Ser. No. 796,650
Int. Cl.[3] G05D *16/20*
U.S. Cl. 137—83 **7 Claims**

1. A pilot stage valve for connecting fluid from an inlet port to first and second outlet ports comprising:

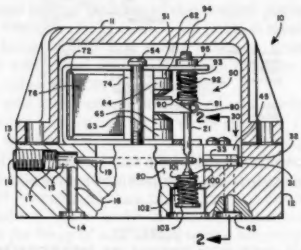
control means for moving an actuating means in response to an input signal;

a jet pipe connected to said inlet port and attached to said actuating means for issuing a jet of fluid; and,

receiver means for receiving said jet of fluid, said receiver means comprising a sandwich construction of

a first receiver plate having a first opening for communicating said jet of fluid to said first outlet port,

a second receiver plate having a second opening for communicating said jet of fluid to said second outlet port, and,



a splitter plate between said first and second receiver plates,

said splitter plate having an extension therefrom and attached to said jet pipe for preventing lateral movement of said jet pipe with respect to said receiver means;

wherein said first and second openings receive a differential amount of fluid dependent upon the position of said jet pipe with respect to said splitter plate.

4,291,717

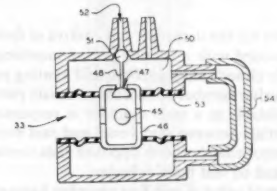
PROPORTIONAL STROKE AUTOMATIC TEMPERATURE CONTROL SYSTEM

John W. Orcutt, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 830,530, Sep. 6, 1977, Pat. No. 4,206,645, which is a division of Ser. No. 501,711, Aug. 29, 1974, Pat. No. 4,063,682, which is a continuation of Ser. No. 422,954, Dec. 7, 1973, abandoned. This application Jul. 19, 1979, Ser. No. 58,888

Int. Cl.³ F15B *5/00*

U.S. Cl. 137—86 **2 Claims**



1. A vacuum valve for regulating vacuum communication from one point to another comprising an upper chamber having a lower end closed by a first flexible diaphragm and a lower chamber having an upper end closed by a second flexible diaphragm, the lower and upper ends spaced from and aligned with one another, a movable valve body including portions respectively attached to each of said diaphragms of the upper and lower chamber and passing through each of said first and second diaphragms, the valve body having an opening between said upper chamber and said upper and lower ends, said valve body opening defining a first valve seat outside said upper chamber a port formed in the upper chamber, a second valve seat within said upper chamber formed in the port, a valve member having first and second sealing ends, the valve member extending through said opening, said sealing ends respectively disposed adjacent the first and second valve seats, the first sealing end adapted to move into and out sealing engagement with the first valve seat and the second sealing end adapted to move into and out of sealing engagement with the second valve seat, the first sealing end operatively connected to the valve body and adapted to selectively transfer motion from the valve body to move the valve member and second sealing end away from the second valve seat, and a balance chamber means fluidly connecting the upper and lower chambers so that each flexible diaphragm receives the same negative pressure from said port thereupon, said diaphragms movable in response to the force differential caused by said pressure acting on said respective diaphramgs in said upper and lower and chambers to control the communication between said port and a second port in said upper chamber.

4,291,718

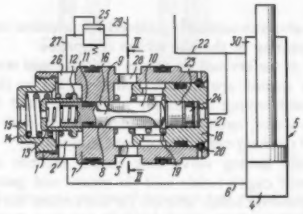
PRESSURE VALVE

Sergei A. Sanin, Oktyabrsky prospekt, 405, korpus 3, kv. 107; Jury F. Ponomarenko, poselok VUGI, 10, kv. 33, both of Ljubertsy Moskovskoi oblasti; Vladislav D. Firstov, ulitsa Shvernika, 22, kv. 25; Vladimir N. Khorin, Fakultetsky pereulok, 3, kv. 206, both of Moscow; Arnold M. Ragutsky, ulitsa Sakko i Vantseti, 5, kv. 4, Malakhovka Moskovskoi oblasti; Boris N. Kostjunin, Teply Stan, 1 mikroraion, korpus 7, kv. 398, Moscow, and Petr M. Bronfen, ulitsa Nurkena Aelirova, 37, korpus 2, kv. 20., Karaganda, all of U.S.S.R.

Filed Feb. 26, 1979, Ser. No. 15,172

Int. Cl.³ F15B *11/18*; G05D *11/00*

U.S. Cl. 137—87 **5 Claims**



1. A pressure valve actuated by pressurized fluid supplied from a pressurized fluid source, comprising:

a housing having a high-pressure space and a low-pressure space separated by a partition in said housing;

openings in said housing for supplying said pressurized fluid into said spaces from said fluid source;

an axial bore in said partition, and a cylindrical valve member reciprocatingly supported in said axial bore;

axial passages in the body of said valve member for alternatingly establishing communication between said spaces upon displacement of said valve member;

a pressure-relief piston accommodated in said low-pressure space and biased away from said partition, said pressure-relief piston being movable in said low-pressure space under the action of said pressurized fluid supplied to initiate the pressure-relieving of said high-pressure space and acting upon the end face of said pressure-relief piston, remote from said valve member;

an axial bore in said pressure-relief piston;

an auxiliary piston accommodated in said axial bore of said pressure-relief piston and cooperating with said valve member for transmitting thereto the displacement of said pressure-relief piston under the action of the fluid pressure supplied to effect the pressure-relieving of said high-pressure space;

throttling passages in the body of said valve member adjacent to said low-pressure space and communicating with said axial passages of said valve member, said throttling passages of said valve member offering a flow passage area which is substantially smaller than that offered by said axial passages, said throttling passages being arranged

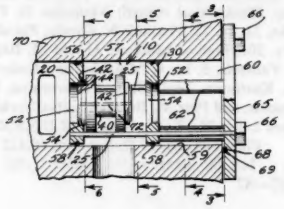
to provide a first stage during the operation of pressure-relieving of said high-pressure space, said high-pressure space and said low-pressure space communicating via said throttling passages of said valve member until said pressure-relief piston abuts said partition and said pressurized fluid drives said auxiliary piston during a second stage to communicate said low pressure space with said high pressure space via said axial passages.

4,291,719

VALVE SUB-ASSEMBLY

Wallace K. Lehmann, Hampton, Md., assignor to The C. M. Kemp Mfg. Co., Glen Burnie, Md.

Filed Apr. 7, 1980, Ser. No. 138,081
Int. Cl.³ G05D *11/03*
U.S. Cl. 137—112 **2 Claims**



1. A valve sub-assembly adapted for insertion inside a channel in a casting or the like which comprises:

a pair of wafers and tie means securing said wafers face-to-face spaced apart, each wafer having at the periphery thereof sealing means for preventing fluid flow around said wafer, each wafer having a valve seat and a valve port opening centrally of each said wafer;

a shuttle having valve face means thereon at each end thereof caged inside said tie means and guided thereon, said shuttle being adapted for movement between wafers from the valve seat of one wafer to the other in response to fluid pressure changes; and,

a face plate secured to one wafer spaced apart therefrom a predetermined distance said face plate including means for creating a sealing attachment to a channel opening in which the valve sub-assembly is inserted,

said tie means being rods extending from one wafer through the other wafer to said face plate serving to secure wafers and face plate together.

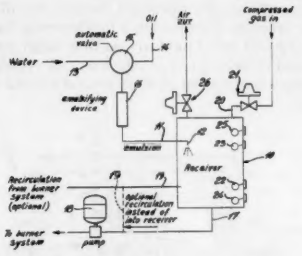
4,291,720

PRESSURE CONTROLLED RECEIVER FOR STORING EMULSION

Roy E. Folland, Clarenceville, Canada, assignor to Folland Corporation, Dade County, Fla.

Filed Apr. 2, 1979, Ser. No. 25,865
Int. Cl.³ B65D *83/14*
U.S. Cl. 137—209 **1 Claim**

1. A pressure controlled emulsion storage receiver for use in an emulsifying system, said receiver comprising an inlet for receiving an emulsion, an outlet for delivering pressurized emulsion from said receiver, a compressed gas inlet for feeding into said receiver pressurized gas from a source, level control means to maintain a level of emulsion between predetermined limits in said receiver, and means to maintain a predetermined gas pressure in the area of said receiver above the emulsion therein whereby said emulsion is maintained at a substantially constant pressure which is the same as the gas pressure in said receiver to prevent said emulsion from vaporizing, said level control means comprising a low and a high level sensor of the float control type in said receiver to sense a predetermined low and high level of emulsion in said receiver, and an overriding float control for each of said low and high level sensors whereby to cut-off delivery of emulsion at said inlet in the



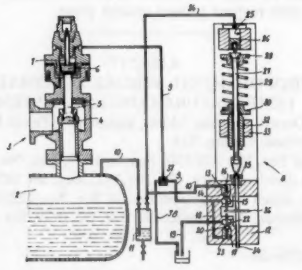
event the emulsion level within said receiver goes beyond said predetermined low and high levels of emulsion.

4,291,721

APPARATUS FOR PRESSURE DETECTION AND CONTROL OF A SAFETY VALVE

Francois Gemignani, 14, Lotissement du Pati, Martigues, (Bouches-du-Rhone), France

Filed Mar. 20, 1979, Ser. No. 22,159
Claims priority, application France, Mar. 21, 1978, 78 08835
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—492 **5 Claims**



1. A device for the detection and control of fluid pressure in a vessel provided with a venting port, comprising:

a normally closed safety valve in said venting port provided with a valve member connected to a main piston, the latter being slidable in a main cylinder in response to pressure differentials between said vessel and said main cylinder;

a first control chamber with opposite ends connected to said vessel and to said main cylinder;

a first control valve in said first chamber having a first valve body reciprocable between an open position and a closed position for alternately unblocking and blocking communication between said vessel and said main cylinder;

a second control chamber with opposite ends connected to the atmosphere and to said main cylinder;

a second control valve in said second chamber having a second valve body reciprocable codirectionally with said first valve body between a closed position and an open position for alternately blocking and unblocking communication between said main cylinder and the atmosphere, said first and second valve bodies having stems aligned with each other in the direction of reciprocation;

a first spring and a second spring respectively urging said first and second valve bodies into their closed positions;

a control cylinder connected to said vessel for pressurization thereby;

a control piston in said control cylinder provided with elastic biasing means tending to maintain same in a normal

position, said control piston being shiftable into an alternate position via an intermediate position by fluid pressure from said vessel overcoming the force of said biasing means;

a control rod operatively connected with said control piston and shiftable thereby along a line paralleling said direction of reciprocation; and

a force-transmitting element on said control rod interposed between the stems of said first and second valve bodies for:

(a) in said normal position of said control piston, keeping said first valve body in the open position thereof against the force of said first spring whereby fluid pressure from said vessel reaches said main cylinder and holds said valve member against a seat;

(b) in said intermediate position of said control piston, allowing said first spring to move said first valve body into the closed position thereof while leaving said second valve body in its closed position whereby said venting port remains closed by said valve member;

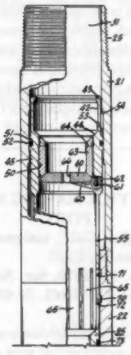
(c) in said alternate position of said control piston, holding said second valve body in the open position thereof against the force of said second spring whereby said main cylinder communicates with the atmosphere, enabling fluid pressure from said vessel to unseat said valve member whereby said fluid pressure is diminished by the opening of said venting port to progressively lower values allowing said control piston to return to said normal position by way of said intermediate position, said valve member remaining unseated until said normal position is restored.

4,291,722

DRILL STRING SAFETY AND KILL VALVE

Ronald K. Churchman, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 5, 1979, Ser. No. 91,086
Int. Cl.³ E21B *41/00*
U.S. Cl. 137—496 **17 Claims**



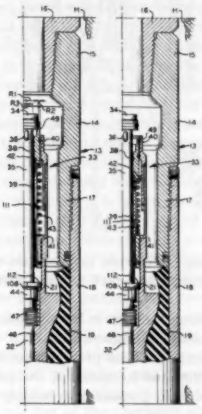
1. A valve for a flow conductor comprising: a valve body connectible in said flow conductor to form an integral flow section thereof; a first valve assembly in said body having means to shut off flow through said body in a first direction when operating in a closed mode, and means to permit flow through said body in a second opposite direction when operating in, said closed mode first valve assembly permitting flow in either direction when operating in an open mode, a second valve assembly in said body having restriction means adapted to permit limited flow through said body in said first direction when said first valve assembly is in said open mode, and full flow through said body in said second direction when said first valve assembly is in said open mode; and valve operator means between said first and said second valve assemblies to close said first valve assembly responsive to closure of said second valve assembly when said second valve assembly is biased toward to said first direction in response to flow in said first direction through said body above said limited flow.

4,291,723

FLUID PRESSURE ACTUATED BY-PASS AND RELIEF VALVE

Herbert W. Beimgraben, and Paul H. Reinhardt, both of Houston, Tex., assignors to Baker International Corporation, Orange, Calif.

Continuation-in-part of Ser. No. 23,202, Mar. 23, 1979. This application Sep. 10, 1979, Ser. No. 73,811
Int. Cl.³ E21B *3/12, 41/00*
U.S. Cl. 137—508 **7 Claims**



6. A fluid pressure actuated by-pass and relief valve connected between a source of fluid under pressure and a fluid flow path comprising: a hollow mandrel having an inlet opening formed in one end thereof exposed to the source of fluid under pressure and an outlet opening formed at the other end thereof; a sleeve slidably received on said mandrel; a normally open by-pass valve actuated by said sleeve and connected between said mandrel outlet opening and the fluid flow path; and a relief port connected to said fluid flow path, wherein, at a first predetermined value of fluid pressure, the force generated by the fluid under pressure acting on a surface of said sleeve slidingly moves said sleeve relative to said mandrel to actuate said by-pass valve to the closed position to block the fluid flow path; and wherein, at a higher second predetermined value of fluid pressure, the force generated by the fluid acting on said surface slidingly moves said sleeve relative to said mandrel to connect said relief port to said inlet opening and establish fluid flow between the source of fluid under pressure and the fluid flow path.

4,291,724

FLOWLINE SWITCHING APPARATUS

Henry W. Miller, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 24, 1980, Ser. No. 162,575
Int. Cl.³ B65G *11/00;* E21B *23/12, 33/05;* F16K *11/00*
U.S. Cl. 137—555 **11 Claims**

1. A flowline switching apparatus comprising

a tubular housing,

a first end closure secured to one end of said tubular housing having a port extending therethrough,

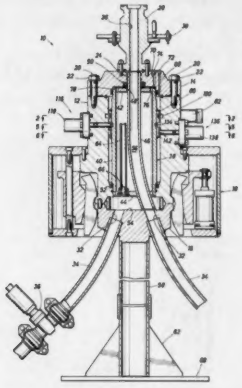
a second end closure secured to the other end of said tubular

housing having a plurality of ports extending therethrough,

a drum within said housing and mounted for rotation therein,

a passage extending through said drum adapted to register with the port in said first end closure and to register in sequence with the ports in said second end closure,

means for rotating said drum,



means for locking said drum in positions of alignment between said passage and each of said ports in said second end closure,

means for indicating the port in the second end closure with which said passage is aligned, and

means for balancing the fluid pressures on interior and exterior of said drum and to minimize the axial loads on said drum responsive to pressures to which the drum is exposed.

4,291,725

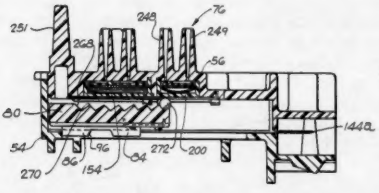
FLUID CONTROL SWITCHES

Andrew F. Raab, Morton Grove, and Raymond T. Halsted, Wheeling, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Division of Ser. No. 893,831, Apr. 6, 1978. This application Sep. 6, 1979, Ser. No. 73,011

Int. Cl.³ F16K *11/06*

U.S. Cl. 137—625.25 **1 Claim**



1. A vacuum valve, comprising

a valve body having a flat wall with a vacuum supply port and a vacuum utilization port therein,

means for connecting a source of vacuum to said vacuum supply port,

means for connecting a utilization device to said vacuum utilization port,

a valve plate movable along said wall,

and means guiding said valve plate for movement along a predetermined path along said wall between first and second positions,

said valve plate having a soft resilient sealing member thereon slidably engaging said wall,

said sealing member having a first sealing enclosure dam in slidable sealing engagement with said wall and enclosing said vacuum supply port throughout the range of movement of said valve plate,

said first sealing enclosure dam being in the form of a first perimeter ridge having a closed perimeter and forming a first closed space between said valve plate and said wall,

said space having a first portion opposite said vacuum supply port throughout the range of movement of said valve plate,

said first portion having a width greater than the range of movement of said valve plate,

said vacuum utilization port being outside said first sealing enclosure dam and being open to the atmosphere when said valve member is in said first position,

said first sealing enclosure dam being movable with said valve plate to enclose said vacuum utilization port as well as said vacuum supply port to establish communication between said ports when said valve plate is in said second position,

said space within said first sealing enclosure dam having a second portion with a reduced width relative to the width of said first portion,

said second portion being in communication with said vacuum utilization port when said valve plate is in said second position,

said valve plate having an intermediate transitional position between said first and second positions,

said first perimeter ridge having a ridge portion which moves over and past said vacuum utilization port when said valve plate is moved between said second position and said intermediate position,

said sealing member having a second sealing enclosure dam in the form of a second closed perimeter ridge in slidable sealing engagement with said wall and enclosing said vacuum utilization port when said valve plate is in said intermediate position,

said ridge portion being a common portion of said second perimeter ridge as well as said first perimeter ridge,

whereby said second sealing enclosure dam prevents any leakage between the atmosphere and said vacuum supply port when said ridge portion is moved over and past said vacuum utilization port so that leakage between the atmosphere and said vacuum supply port is prevented throughout the range of movement of said valve plate.

4,291,726

ACCUMULATOR DEVICE HAVING SAFETY CHARGING PORT

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Incorporated, Chatsworth, Calif.

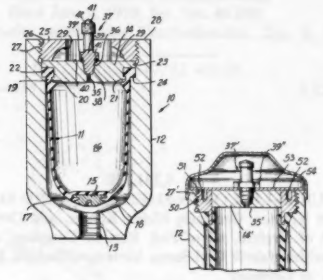
Filed Nov. 13, 1979, Ser. No. 93,042

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—30 **2 Claims**

1. A hydraulic accumulator device comprising, in combination, a pressure vessel having an oil port at one end and having an open mouth portion at the other end, an internal retainer thread portion formed in surrounding relation of said open mouth portion, a cap member seated in sealing relation of said open mouth portion, said cap member including a threaded gas charging port, a gas charging valve assembly threadedly engaged in said gas charging port, a bladder assembly mounted in said vessel and dividing the same into two chambers in communication, respectively, with said oil and said gas ports, an annular retainer nut member having an external threaded portion threadedly engaged with said retainer thread and including stop portions overlapping said cap member and clamping said cap member against movement axially outwardly of said mouth portion, socket means on said retainer nut member accessible through said open mouth portion, driver tool means adapted to be engaged with said socket means for providing a

driving connection between said retainer nut member and said tool means to permit threading and unthreading of said nut from said retainer thread, and blocking means secured to said cap assembly by said gas charging valve assembly interposed



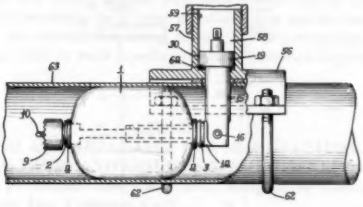
between said tool means and said socket means for blocking access of said tool means to said socket means while said gas charging valve assembly is positioned in said gas port, whereby said valve assembly must be removed as a condition precedent to engagement of said tool and socket.

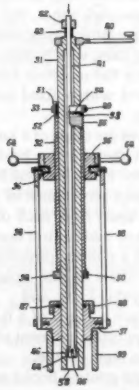
4,291,727

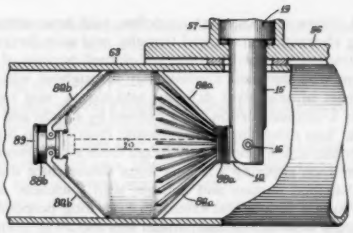
PIPELINE FLOW RESTRICTOR AND PROCESS

Gene G. Yie, Chicago, and Thomas M. Bevan, Homewood, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Feb. 28, 1979, Ser. No. 16,025
Int. Cl.³ F16L *55/12*; B23B *45/12*
U.S. Cl. 138—93 **9 Claims**







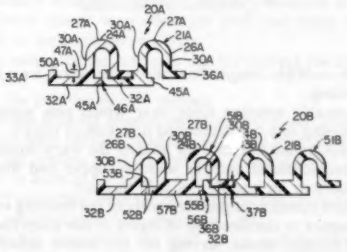
1. A flow restrictor cartridge for insertion through a hole in a pipeline side wall in combination with an insertion assembly wherein said flow restrictor cartridge comprises a substantially circular rear end plug, a cylindrical expandable flexible sleeve having an opening in the central portion of one end attached in substantially fluid-tight relation to the periphery of said rear end plug, said rear end plug having a through flow passage having one end in communication with the interior portion of said flexible sleeve and the other end adapted for communication with supply means providing fluid for inflating said flexible sleeve, the side of said rear end plug exterior to said flexible sleeve having attachment means for engagement with mating attachment means of said insertion assembly, said flow restrictor cartridge having a deflated length less than the inside diameter of the pipe in which it is to be used; and said insertion assembly comprising a cartridge elbow and a cartridge adapter cylinder; said cartridge elbow having a mating attachment means at one end mated with said cartridge rear end plug attachment means and a pivot means at the other end; said cartridge adapter cylinder having pivot receiving means at one end and a flanged adapter head at the other end, the pivot means of the cartridge elbow and the pivot receiving means of the cartridge adapter cylinder engaging; a spring means engaged with said pivot means and said pivot receiving means to provide rotation of the cartridge elbow from a position having its axis parallel to that of the cartridge adapter cylinder to a position extending perpendicular to the axis of the cartridge adapter; and a tube extending through the central portion of the cartridge adapter cylinder in communication, when the cartridge elbow and adapter cylinder are perpendicular, with a passage through the cartridge elbow in communication with said rear plug through flow passage.

4,291,728

HOSE CONSTRUCTION

Liggett A. Cothran, Clyde, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 4, 1980, Ser. No. 137,164
Int. Cl.³ F16L *11/04*
U.S. Cl. 138—122 **20 Claims**



1. In a convoluted hose construction comprising an elongated elastomeric strip having first and second connecting means defining opposite side edge portions thereof, said strip being helically wound with said first and second connecting

means connected together to define said hose construction having alternating crests and troughs, said strip having a free unobstructed outwardly convex U-shaped portion of a single uniform wall thickness continuously throughout which is the only part of said strip defining said crests, said outwardly convex U-shaped portion being defined by a bight and a pair of parallel legs extending from opposite ends of said bight, said hose construction being easily flexed from a rectilinear configuration upon applying a flexing force thereagainst due to said free U-shaped portion and uniform wall thickness, said strip comprising a first lateral extension extending perpendicularly outwardly from one of said parallel legs and away from both of said legs, the improvement in which, said first lateral extension has an outer end portion provided with an integral projection disposed parallel to said parallel legs, said first extension together with said integral projection and a portion of one of said parallel legs defining a wide base shallow channel which has an open end opening in a direction opposite from the direction of opening of said outwardly convex U-shaped portion and comprising said first connecting means, and a second lateral extension of rectangular cross-sectional configuration extending perpendicularly outwardly from the outer edge of said other of said parallel legs so that said U-shaped portion is disposed roughly in the central part of said strip, said second lateral extension being disposed and fixed within said channel and comprising said second connecting means, said lateral extensions being substantially of said uniform thickness and upon disposing said strip in said helical pattern said extensions cooperate to define said first and second connecting means having a radial thickness comprised of substantially twice said uniform thickness thereby assuring minimum material usage and thus minimum cost.

4,291,729

MULTIPLE LONGITUDINAL TRAVERSING SHED WEAVING APPARATUS

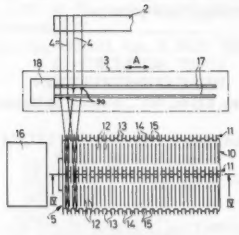
Alois Steiner, Rieden, Switzerland, assignor to Rüti Machinery Works Ltd., Rüti, Switzerland

Filed Nov. 23, 1979, Ser. No. 96,777

Claims priority, application Switzerland, Dec. 7, 1978, 12512/78

Int. Cl.³ D03D *41/00*

U.S. Cl. 139—28 **7 Claims**



1. A multiple longitudinal traversing shed weaving loom comprising:

a rotatable weaving rotor over which pass warp threads moving in a predetermined direction of travel;

shed-retaining elements for holding the warp threads over a predetermined path in selective upper and lower shed positions for insertion of weft threads;

control means arranged forwardly of the weaving rotor with respect to the direction of travel of the warp threads;

said control means serving for the lateral deflection and allocation of each warp thread to a shed-retaining element which determines the upper shed position or the lower shed position;

said control means comprising displaceable elements extending in the direction of insertion of the weft threads; and

said control means further including an actuation mechanism with which there are operatively connected said displaceable elements for displacing the latter in said direction of insertion of said weft threads.

4,291,730

DOUBLE-LIFT OPEN-SHED JACQUARD MACHINE

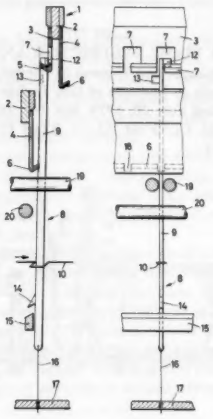
Hubert Kremer, Grefrath; Heinz Königs, and Otto Gutmann, both of Krefeld, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Carl Sangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Oct. 26, 1979, Ser. No. 88,382

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846793

Int. Cl.³ D03C *3/06*

U.S. Cl. 139—65 **12 Claims**



1. In a double-lift open-shed Jacquard machine with two lifting bars which are movable in opposite directions to each other and which pass each other, and with lifters controllable by main needles, the latter being arranged transverse to the knives of the lifting bars, which lifters have two main projections associated with the movable knives and one holding-up projection associated with a fixed upper-shed knife, the improvement wherein

the movable knives are made of a knife carrier part and hook plates fastened thereto, the hook plates having control hooks, the latter being formed bent off in the direction towards the main projections of the lifters and being arranged spaced apart from each other,

said hook plates and said control hooks thereof being formed so to permit in a control direction of the main needles a passage of the lifters up into a plane between said control hooks of a movable knife, and

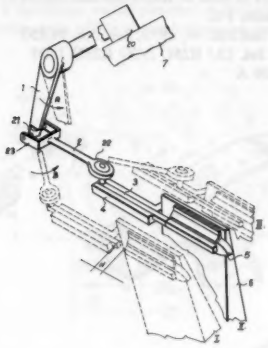
the lifters have each a shank of a flat rectangular cross-section, the greater tilting moment of which is in the control direction of the main needle,

at least one of said control hooks and the main projections are beveled such that an overlapping thereof increases during a driving of said lifters.

4,291,731
MECHANISM FOR LAUNCHING GRIPPERS IN GRIPPER LOOMS

Miloslav Prohazka, Nachod, and Karel Kaulich, Cerveny Kostelec, both of Czechoslovakia, assignors to ELITEX, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Jun. 6, 1979, Ser. No. 45,935
Claims priority, application Czechoslovakia, Jun. 6, 1978, 3663-78
Int. Cl.[3] D03D *47/42, 49/24*
U.S. Cl. 139—438 4 Claims

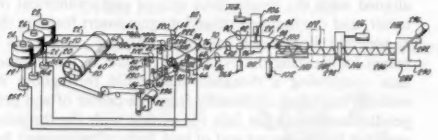


1. Mechanism for launching a gripper in a gripper loom having a beat-up mechanism including a slay, comprising a gripper launching power source fixedly positioned on the loom, a gripper, a guideway for the gripper on the slay, an impact element on the slay, the gripper launching arm connected to and driven by the launching power source, and a connection between the gripper launching arm and the impact element, the connection being formed by a connecting rod having on both its ends couplings with at least two degrees of freedom.

4,291,732
METHOD AND APPARATUS FOR MANUFACTURE OF WIRE TRUSS AND SINUOUS STRUT THEREFOR

Richard F. Artzer, Riverside, Calif., assignor to Covington Brothers, Inc., Fullerton, Calif.

Filed Feb. 26, 1979, Ser. No. 14,988
Int. Cl.[3] B21F *1/04*
U.S. Cl. 140—112 48 Claims

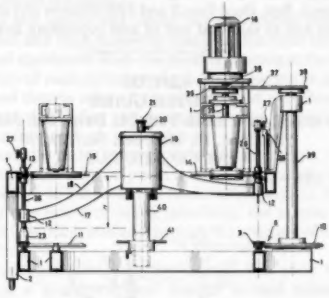


1. The method of making a wire truss comprising
clamping a first wire at a rearward area thereof that is rearwardly spaced from a previously bent forward area thereof,
moving blocking dies into engagement with said previously bent area to resist forward and transverse motion of said wire at said previously bent area,
transversely displacing an intermediate area of said wire between said forward and rear areas, said step of transversely displacing an intermediate area comprising pivoting a displacement die guide toward said blocking dies, engaging said intermediate area with a displacement die, and driving said displacement die along said guide,
moving said rearward and forward areas toward each other as said intermediate area is displaced, whereby said wire is bent at each of said areas,
withdrawing said blocking dies,
advancing said wire,
clamping said wire at a second rearward area displaced from said first mentioned rearward area,
moving blocking dies into engagement with said first mentioned rearward area, after it has been bent, to resist forward and transverse motion thereof,
transversely displacing a second intermediate area of said wire between said first mentioned and second rearward areas, moving one of said rearward areas toward the other as said second intermediate area is displaced, whereby said wire is bent at said second intermediate area, at said second rearward area, and is further bent at said first mentioned rearward area,
assembling first and second lateral wires to said first wire in contact therewith at points near said bent areas, and attaching said wires to each other at points of contact therebetween.

4,291,733
DEVICE FOR HANDLING CONTAINERS

Pieter A. Polderman, Ah Heemstede, Netherlands, assignor to Stork Repak B.V., Utrecht, Netherlands

Filed Jun. 11, 1979, Ser. No. 47,321
Claims priority, application Netherlands, Jun. 9, 1978, 7806303; Nov. 10, 1978, 7811174
Int. Cl.[3] B65B *43/42*
U.S. Cl. 141—152 14 Claims



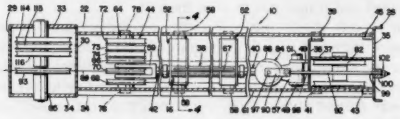
1. A device for handling and filling containers comprising
(a) a conveyor for containers, a portion of the path of said conveyor having the shape of an almost closed loop;
(b) a common provision;
(c) a plurality of active members movably mounted above the almost closed loop conveyor path and being connected to the common provision;
(d) drive means for the conveyor and for moving the active members;
wherein the improvement comprises:
(e) an endless drawing member mounted above and traveling in a path lying parallel to the almost closed loop conveyor path, the endless drawing member being directly connected to each of the active members;
(f) a shaft extending from the drive means, the drive means being mounted above the conveyor path;
(g) means for connecting the shaft to the endless drawing member; and
(h) means for connecting the shaft to the conveyor, such that the endless drawing member and the conveyor are driven by the shaft;
the almost closed loop portion of the conveyor path having a polygonal shape.

4,291,734

TREE PROCESSING APPARATUS

Howard A. Hammond, Grayslake, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 17, 1980, Ser. No. 112,751
Int. Cl.³ B27L *1/00*
U.S. Cl. 144—2 Z **16 Claims**



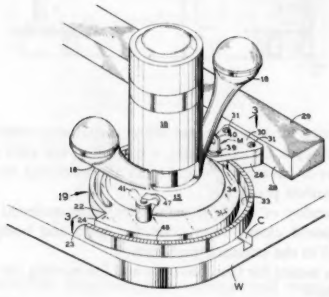
1. Apparatus for processing trees comprising an elongated boom; a processing head movable along said boom and operable to delimb trees positioned adjacent said boom and in parallel relation thereto; a hydraulic cylinder mounted on said boom, said cylinder having a first end member attached to said boom and a second end member movable relatively toward and away from said first end member; a first sheave mounted for rotation on said second end member; a second sheave mounted for rotation on said boom and spaced from said first sheave in a direction extending toward said first end member; a third sheave mounted for rotation in a stationary position relative to said boom between said first and second sheaves; a fourth sheave mounted for rotation on said second end member; a fifth sheave mounted for rotation on said boom and spaced from said fourth sheave in a direction extending toward said first end member; and a first cable attached to one end to a first end of said processing head, reeved respectively over said second, first, third fourth and fifth sheaves and attached at the other end to said first end of said processing head.

4,291,735

ROUTER GUIDE

Howard Silken, 9676 Bridle Path Ct., Davie, Fla. 33328

Filed Mar. 10, 1980, Ser. No. 129,175
Int. Cl.³ B27C *5/10*
U.S. Cl. 144—136 C **14 Claims**



1. An adjustable guide for a router having a motor-driven bit, said guide comprising:

a guide plate having a central opening for passing the router bit and an eccentric peripheral edge which progresses along a uniform spiral path from a point of minimum radius from the center of the guide plate to a point of maximum radius therefrom;

a slide extending beyond said peripheral edge of the guide plate at a particular location therealong and having an exposed straight edge;

coupling means acting between said slide and said guide plate for maintaining said straight edge of the slide perpendicular to a radius from the center of the guide plate to said slide at all positions of the latter along the eccentric peripheral edge of the guide plate;

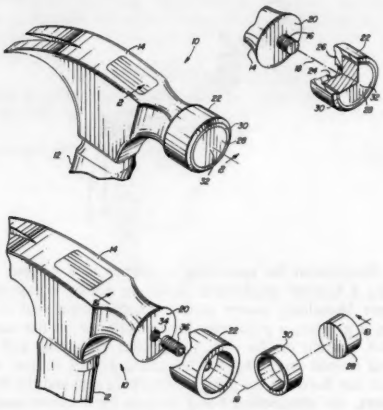
and means for releasably clamping said slide and said guide plate together at any selected position of the slide along the eccentric peripheral edge of the guide plate.

4,291,736

MAGNETIC HAMMER

Alan D. Robertson; Blythe J. Robertson, both of 2808 Tradewinds Trail, Orlando, Fla. 32805, and Gerald Olson, Pearland, Tex., assignors to Alan D. Robertson and Blythe J. Robertson, both of Orlando, Fla.

Filed Jul. 19, 1979, Ser. No. 58,857
Int. Cl.³ B25C *1/00*; B25D *1/00*
U.S. Cl. 145—30 A **11 Claims**



1. A magnetic hammer comprising:

a. a handle;

b. a hammer body attached to the handle and including a flat face;

c. a cylindrical magnet insert having first and second ends and first and second magnetic poles aligned with the axis of said magnet insert;

d. a cylindrical retainer having a first end, a second end and a threaded aperture in the second end, and including a cylindrical chamber sized to receive and retain said magnet insert, the longitudinal axis of said magnet insert being aligned with the longitudinal axis of said cylindrical retainer, and the first end of said magnet insert forming the hammering face of said hammer; and

e. means for securing the cylindrical retainer to the hammer face comprising a threaded shaft solid throughout its entirety extending outwardly from the center of and perpendicular to said flat face for mating with the threaded aperture in the second end of said cylindrical retainer for securing the second end of said cylindrical retainer to the flat face of said hammer body.

4,291,737

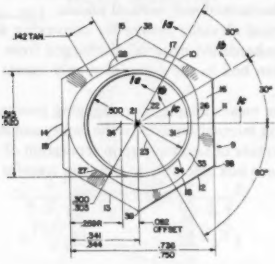
PREVAILING TORQUE LOCK NUT AND METHOD OF FORMING SAME

John C. McMurray, Painesville, and Arthur G. Kudelko, Mentor, both of Ohio, assignors to Russell, Burdsall and Ward Corporation, Mentor, Ohio

Filed Mar. 5, 1979, Ser. No. 17,611
Int. Cl.³ F16B *39/284*
U.S. Cl. 411—282 **12 Claims**

1. A prevailing torque hexagonal lock nut comprising a body having a load face at one end and a substantially cone portion

at its other end with a hexagonal portion therebetween, said body also having a central threaded passage extending along a central axis open at one end through said load face and open at its other end through said cone portion, said hexagonal portion providing flats and corners parallel to said central axis adapted to receive a wrench for turning said nut, the end of said cone portion having a substantially circular periphery and three similar threaded locking sections of reduced radial distance substantially symmetrically positioned around said threaded passage, each locking section having a center of minimum radial distance and extending with gradually increasing radial distance to a maximum radial distance at locking section ends adjacent to the ends of the other locking sections, said minimum radial distance being less than the radius of a mating threaded fastener and said maximum radial distance being greater than the radius of said mating threaded fastener, engaged portions of said locking sections being radially deflected to a substantially circular shape when said nut is threaded onto said mating threaded fastener to provide three areas of frictional locking therewith, said cone providing a maximum stiffness resisting radial deflection at said centers of each of said locking sections and lower stiffness at the ends thereof whereby deflection of said locking sections to said circular shape causes a pressure of engagement along each of said areas which is sufficiently uniform to provide locking torque without excessive wear of the engaging threads or material permanent deformation of said cone.

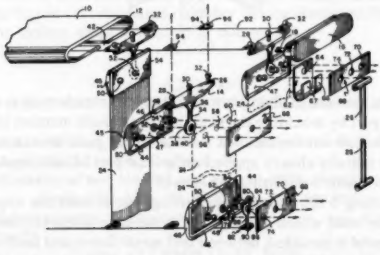


4,291,738

UNIVERSAL SUPPORT FOR VERTICAL BLINDS AND THE LIKE

John Grenga, and Samuel Frydman, both of 30 Carter Dr., Framingham, Mass. 01701

Filed Feb. 5, 1979, Ser. No. 9,069
Int. Cl.³ E06B *9/262, 9/32*
U.S. Cl. 160—176 R **7 Claims**



1. An improved structure for the support and operation of hanging elements and the like such as vertical blinds having a plurality of louvers rotateably and slideably affixed to an elongated support member affixed to the top of the area where said hanging elements are hung wherein the improvement comprises:

said elongated support member being a track having a channel defined therein, said track being of a width substantially equal to the width of said hanging elements, said track further having an elongated opening defined in said channel extending its full length in a central part of the bottom thereof;

a plurality of carriers adapted for suspension of said hanging elements to said track, said carriers being further adapted to be slideably supported within said channel, each of said carriers having:

a horizontally disposed planar support member with top and bottom sides; first and second operation projections, each positioned on opposite ends of the top of said support member, said first and second projections each having a protuberance at the ends thereof;

a vertically disposed shaft affixed to the bottom of said support member in a central position, said shaft having a wider portion at its top forming a truncated cone at its junction with said support member, said wider portion adapted to travel in said elongated opening of said channel so that only a small portion of said vertical shaft contacts the sides of said opening;

a ring member affixed at the bottom of said vertical shaft;

a first link means for interconnecting each of said first operation projections on said carriers to first operation projections on another of said carriers at equidistant predetermined spacings;

a second link means for interconnecting each of said second operation projections on said carriers to second operation projections on another of said carriers at equidistant predetermined spacings;

said first and second link means being contained within said channel and each including spacer cables with tab means spaced equidistant from one another thereon at the desired position of each carrier, said tab means having an aperture defined therein adapted to pass over the protuberance at the end of each first and second operation projections and be retained on such projections;

a substantially rectangular planar first plate member having a first lateral retention projection, second central retention projection, and third lateral retention projections disposed along one face protruding therefrom, the second central projection being inserted through the aperture of said ring member;

a lip positioned along the top of said first plate member having a groove defined therein located substantially above said central projection, said groove adapted to receive said shaft;

said hanging element having three apertures defined at its top into which are inserted said first plate member's first lateral retention projection, second central retention projection and said third lateral retention projection;

a substantially rectangular planar second plate member having three apertures defined therein into which are inserted said first lateral projection, second central projection and third lateral projection of said first plate member after said projections have engaged the top of the hanging elements, said first plate and said second plate adapted to hold said hanging element securely therebetween;

at least one control rod clip affixed between one pair of said first and second plates, said control rod clip having an aperture defined therein for receipt of said first plate's second central retention projection and further including a curved portion adapted to extend out from the bottom between said first and second plates, said extending portion having a slot defined therein; and

at least one control rod having a T-shaped end the horizontal top of which is held in the curved portion of said control rod clip and having its vertical shaft member held in said clip's slot wherein rotation of said control rod rotates the carrier to which said control rod clip is attached and moves said first and second link means to cause similar

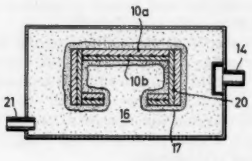
rotation of the other carriers, and the movement of the control rod in a direction horizontal to said track causes like horizontal movement of said carriers within said track.

4,291,739

METHOD OF MANUFACTURING A HOLLOW CASTING MOLD

Eduard Baur, Post Hommerich, 5256 Waldbruch, Fed. Rep. of Germany

Filed Aug. 16, 1979, Ser. No. 67,555
Int. Cl.³ B22C *9/04*
U.S. Cl. 164—5 **12 Claims**



1. A method of manufacturing of a casting mold, comprising the steps of forming a casting mold body of a flowable binder-free backfilling mass; stabilizing the casting mold body by negative pressure; providing in said body a lost form of synthetic plastic material; withdrawing a portion of the binder-free backfilling mass, after pouring of molten metal and during beginning of hardening of the cast part.

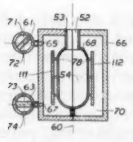
4. A lost form for a casting mold of a negative-pressure stabilized flowable binder-free backfilling mass, comprising plate elements of synthetic plastic material having faces which face toward one another; and an intermediate web-like element provided on said faces.

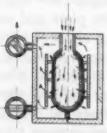
4,291,740

APPARATUS AND METHOD FOR HEATLESS PRODUCTION OF HOLLOW ITEMS, FOR INSTANCE, FOUNDRY SHELL CORES

Anatol Michelson, 3235 Pine Valley Dr., Sarasota, Fla. 33579

Filed May 28, 1980, Ser. No. 154,006
Int. Cl.³ B22C *13/08*
U.S. Cl. 164—7.1 **21 Claims**





1. An apparatus for heatless production of hollow items, such as foundry shell cores, from binder coated granular minerals, comprising:

(a) A separable-part pattern box assembly having an investment aperature in the upper end rotatingly mounted on a support frame, and selectively positionable in a material receiving position, a material discharging position, and an item transfer position;

(b) Granular material supply means pivotally disposed above the pattern box assembly and adapted to reciprocate in horizontal and vertical planes;

(c) Granular material storage means, pivotally connected above said material supply means and having freedom of movement at least in horizontal plane;

(d) Sealing means pivotally mounted on said granular material supply means, having an actuator and an elastic element selectively positionable over the investment aperture of pattern box and away from it;

(e) Trimming means with a cutting element pivotally mounted over the pattern box, and adapted to reciprocate in both horizontal and vertical planes;

(f) Mechanical elevator system for conveying solvent containing unhardened material discharged from underneath the pattern box to the material supply means above said box, and;

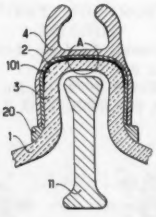
(g) Transfer means adapted for engaging produced item by contacting internal surfaces of the cavity and of the investment aperture of said item upon separation of the parts of said pattern box assembly in the item transfer position.

4,291,741

METHOD OF FIXING A METAL STRENGTH MEMBER ON A NON-METAL PART

Michel Willem, Vichy, France, assignor to Ceraver, Paris, France

Filed Oct. 12, 1979, Ser. No. 84,205
Claims priority, application France, Oct. 13, 1978, 78 29245
Int. Cl.³ B22D *19/00*
U.S. Cl. 164—9 **7 Claims**



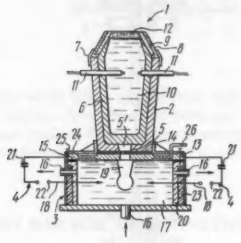
1. A method of fixing a metal strength member on a non-metal part by moulding the metal of the strength member in the molten state on the head of the non-metal part, over a metal sleeve initially closely applied on at least part of said head, the improvement comprising the step of:

inserting a fibre glass layer throughout at least tha zope of the head which corresponds to the area where the molten metal is moulded, between said metal sleeve and said head, with said layer bearing an inert non-adhering inorganic substance, so that said layer is compressed between the head and the metal sleeve when the metal sleeve is applied against said head during moulding of said metal strength member.

4,291,742
METHOD AND APPARATUS FOR OBTAINING AN INGOT

Vladimir A. Korytov, ulitsa Nikolaevskaya, 9, kv. 64; Pavel P. Maljushevsky, prospekt Oktyabrsky, 17a, kv. 41; Grigory A. Guly, ulitsa Inzhenernaya, 13, kv. 5; Alexandr S. Shkatov, ulitsa Olshanskogo, 14, kv. 6, all of Nikolaev; Vladimir T. Sladkoshteev, ulitsa Dzerzhinskogo, 34, kv. 11, Kharkov; Ruslan V. Patanin, ulitsa Gagarina, 80, kv. 128, Kharkov; Vasily I. Dorokhov, ulitsa Dzerzhinskogo, 34, kv. 6, Kharkov; Georgy A. Klemeshov, ulitsa Pushkinskaya, 40, kv. 11, Kharkov, and Grigory E. Arkulis, ulitsa Oktyabrskaya, 8, kv. 23, Magnitogorsk, all of U.S.S.R.

Filed Nov. 9, 1977, Ser. No. 849,992
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—501 **12 Claims**



1. An improved method for obtaining an ingot formed in a mould comprising: imparting a single source of elastic oscillations on metal melt undergoing crystallization, said elastic oscillations being within the range of the natural or resonant frequencies of said ingot and being in the form of pulses generated by a high-voltage spark discharge across a liquid having a resistivity above 0.5 Ohm.m., and thereafter inducing said elastic pulse oscillations simultaneously with the filling of said mould with molten metal and imparting same to the melt undergoing crystallization, until the beginning of the process of volumetric crystallization of the melt, and the pulse repetition rate and pulse energy being such as to prevent transcrystallization of said metal; whereby heavy weight ingots can be produced free of dendrites or metal crystals and of a more fine-grained uniform structure.

3. An apparatus for obtaining an ingot comprising: a mould adapted to contain molten metal; a source of elastic oscillations transmitted to the molten metal and comprising at least one substantially closed discharge chamber filled with a liquid having a resistivity above 0.5 Ohm.m, said chamber being provided with a plurality of electrodes, and a pulse current oscillator connected to the positive and negative electrodes for pulse shaping by a high-voltage spark discharge in said liquid, said discharge chamber being mounted in mutual cooperative association with said mould such that high-voltage discharges occurring in said discharge chamber induce elastic oscillations in the molten metal contained in said mould.

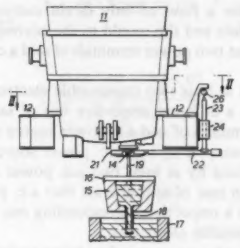
4,291,743
METHOD AND APPARATUS FOR POURING MOLTEN METAL

Sebastian Aftalion, Glasgow, Scotland, assignor to British Steel Corporation, London, England

Continuation of Ser. No. 941,664, Sep. 12, 1978, abandoned. This application Mar. 28, 1980, Ser. No. 134,962
Claims priority, application United Kingdom, Sep. 13, 1977, 38174/77
Int. Cl.³ B22D *11/10, 23/00*
U.S. Cl. 164—66.1 **18 Claims**

1. Apparatus for protecting an exposed metal stream from the surrounding atmosphere when the metal stream is being poured from a nozzle controlled by a stopper rod or a slide gate valve into a receiver, comprising means for providing inert gas, said means being in the form of a metallic walled distributor dimensioned and apertured to project said gas inwardly around the nozzle exit at such a rate as to provide a zone of the said gas surrounding the nozzle exit and moving downwardly around the stream, the width of the zone of gas inwardly directed around the nozzle exit being (a) at least one-third of the length of the poured metal stream between the nozzle exit and the receiver and (b) at least about 600 mm.

17. A method of protecting a metal stream from the surrounding atmosphere when the metal stream is being poured

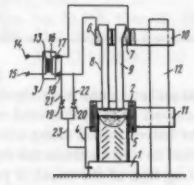


from the nozzle into a receiver, comprising positioning a source of inert gas having an annular gas duct to encircle the exit of the nozzle, said annular gas duct being so dimensioned and apertured to project an inert gas both inwardly and downwardly to provide a non-laminar, low turbulence zone of inert gas surrounding the nozzle exit and extending from the nozzle exit downwardly around the metal stream for the entire length of the stream as far as the receiver, said zone of inert gas possessing a flow regime having a Reynolds number between about 5,000 and 50,000.

4,291,744
APPARATUS FOR ELECTROSLAG REMELTING OF CONSUMABLE ELECTRODES

Boris I. Medovar, ulitsa A. Barbjusa, 22-26, kv. 109; Viktor L. Artamonov, ulitsa Shumskogo, 8a, kv.90; Pavel I. Kirsanov, ulitsa Belorusskaya, 15b, kv. 10; Alexandr M. Marchenko, ulitsa Stroitelei, 17, kv. 18; Alexei G. Bogachenko, ulitsa Sapernoe pole, 26a, kv. 30; Leonid V. Pavlov, prospekt Komarova, 28, kv. 6, all of Kiev; Jury M. Kamensky, ulitsa Novatorov, 42/5, kv. 143, Moscow; Ruslanbek B. Gutnov, ulitsa Chelyabinskaya, 23, korpus 2, kv. 199, Moscow, and Pavel M. Platonov, 9 Parkovaya ulitsa, 78/2, kv. 78, Moscow, all of U.S.S.R.

Filed Feb. 14, 1979, Ser. No. 12,076
Int. Cl.³ B22D *27/02;* H05B *7/18*
U.S. Cl. 164—509 **4 Claims**



1. An apparatus for the electroslag remelting of at least two consumable electrodes comprising:

a.c. power source means provided with at least two power terminals for providing a.c. power;

a bottom plate electrically connected to said a.c. power source means;

a mould electrically connected to said bottom plate; and

direct connection means directly connecting said at least

two power terminals to each of said bottom plate and said mould, said direct connection means comprising rectifiers, one rectifier being provided for each of said at least two power terminals, each of said rectifiers having a conductive state for electrically connecting a corresponding one of said at least two power terminals to each of said bottom plate and said mould to establish direct electrical connection therebetween,

said rectifiers having a conductive direction leading from said bottom plate and said mould, on the one hand, to said at least two power terminals, on the other hand, so as to provide for a flow of only direct current through the bottom plate and the mould to the corresponding one of said at least two power terminals of said a.c. power source means;

each of said at least two consumable electrodes being connected to a different respective one of said at least two power terminals of said a.c. power source means, said a.c. power generated by said a.c. power source means being characterized by at least two a.c. power cycles, so that each given one of said at least two a.c. power cycles is applied to a respective corresponding one of said at least two consumable electrodes;

each of said at least two rectifiers being exclusively actuated to said conductive state during a corresponding respective one of said at least two a.c. power cycles;

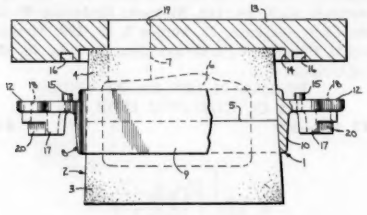
whereby said mould suffers no harmful effects due to spark discharge.

4,291,745

FOUNDRY MOLD JACKET

Willard R. Scheiderer, Wausaukee, Wis., assignor to Grede Foundries, Inc., Milwaukee, Wis.

Filed Dec. 14, 1979, Ser. No. 103,453
Int. Cl.³ B22C *21/00*
U.S. Cl. 164—394 **7 Claims**



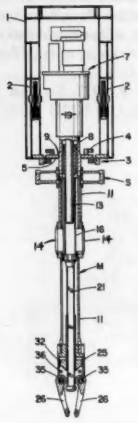
1. A foundry mold jacket, comprising a body portion having a central opening adapted to receive a sand mold having mating upper and lower halves joined along a horizontal parting line, said body portion having a substantial depth and adapted to straddle the parting line of the mold, a pair of extensions extending laterally from opposite sides of the body portion, said extensions extending vertically on either side of a horizontal plane passing through the vertical mid-point of said body portion, first locating means on the upper surface of each extension and adapted to position a separate weight on the upper surface of the body portion, and second means on each extension aligning a lifting means with said extension and adapted to receive a lifting member capable of lifting said jacket.

4,291,746

APPARATUS FOR STRIPPING INGOTS FROM MOLDS

Earl H. Sigman, Alliance, Ohio, assignor to AMCA International Corporation, Alliance, Ohio

Filed Jan. 15, 1979, Ser. No. 3,307
Int. Cl.³ B22D *29/08*
U.S. Cl. 164—407 **5 Claims**



1. In an ingot stripping and handling mechanism comprising a frame, a first tubular element depending from said frame, a second tubular element telescopically mounted over part of said first tubular element downwardly of said frame, said first and second tubular elements being coaxially aligned and axially movable relative to each other, means depending from said second tubular element for engaging ingots and ingot molds and for removing ingots from ingot molds, and means disposed within said frame and extending coaxially with said first and said second tubular elements for driving said first named means, the improvement which comprises:

a shock absorber comprising a first resilient metallic disc, a second resilient metallic disc, each of said discs being mounted on said mechanism in parallel spaced relationship to each other downwardly of said frame, each of said discs having a center opening including an inner periphery and an outer periphery radially spaced from said inner periphery, each of said discs being attached to each other by an annular element disposed between each of said discs adjacent to each of said outer peripheries, the inner periphery of said first disc engaging the outer surface of said first tubular element and the inner periphery of said second disc engaging the outer surface of said second tubular element.

4,291,747

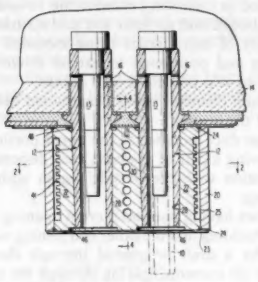
COOLER FOR TWIN STRAND CONTINUOUS CASTING

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Filed Oct. 31, 1979, Ser. No. 89,856
Int. Cl.³ B22D *11/10, 11/00*
U.S. Cl. 164—420 **25 Claims**

1. Twin strand continuous vertical casting apparatus comprising in combination; a jacket, a cooling member having a body of heating conducting material located in the jacket and having internal walls defining a pair of vertical laterally spaced die passages extending generally along parallel axes for receiving bar-forming dies in intimate contacting relationship, a pair of bar-forming dies respectively received in said die passages in intimate relationship with the internal walls defining said passages, a first inlet port through the jacket for introducing a coolant into the jacket to contact the body, a first outlet port through the jacket for discharging coolant from the jacket, a

coolant flow passage extending through the body between said pair of vertical die passages for circulating coolant through the body, said body of the cooling member having an outer surface including annular ridges extending about and along the body in



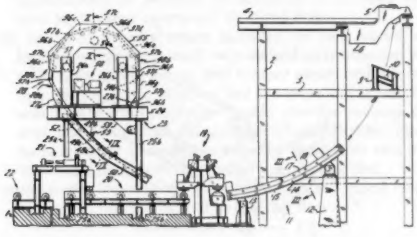
helical fashion while being spaced from the jacket to define a plurality of coolant flow channels between the body and the jacket and said coolant flow passage communicating with said coolant flow channels defined by said annular ridges.

4,291,748

DUMMY BAR FOR A CONTINUOUS CASTING MACHINE

Carl Langner, Monsey, N.Y., assignor to Concast Incorporated, Montvale, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,059
Int. Cl.³ B22D *11/08*
U.S. Cl. 164—426 **20 Claims**



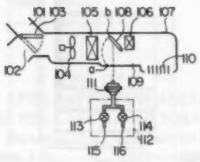
1. A continuous casting installation comprising:
(a) a mold having an open-ended casting passage;
(b) an arcuate cooling zone downstream of said mold having a predetermined casting radius;
(c) a device downstream of said mold for withdrawing a continuously cast strand from said mold;
(d) a dummy bar for initiating the withdrawal of the strand from said mold, said dummy bar having a length at least equal to the distance from said mold to said device, and said dummy bar including a rigid portion and a flexible portion, said rigid portion being arcuate and having a radius equal to said casting radius and a length which is a substantial fraction of said distance, and said rigid portion having an end which closes the outlet end of said casting passage at the beginning of a casting operation and is provided with coupling means for establishing a connection with the strand, said flexible portion being capable of bending to a radius substantially smaller than said casting radius; and
(e) storage means for said dummy bar, said storage means comprising a first section for said rigid portion and a second section for said flexible portion, said first section including arcuate first support means having a radius equal to said casting radius and said second section including arcuate second support means having a radius substantially smaller than said casting radius.

4,291,749

METHOD AND APPARATUS FOR CONTROLLING COMPARTMENT TEMPERATURE OF A VEHICLE

Fumio Ootsuka, Kariya; Morimasa Ninomiya, Chiryu; Norio Maehara, and Akiro Yoshimi, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 29, 1979, Ser. No. 98,598
Claims priority, application Japan, Dec. 27, 1978, 53/162691
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—27 **3 Claims**



1. An apparatus for controlling the temperature of the compartment of an automobile having cooler means for supplying the cooled air, heater means for supplying the heated air and adjuster means for adjusting the rate of supply of said cooled and heated air to said compartment, said apparatus comprising:
means for establishing a desired compartment temperature;
means for sensing an actual compartment temperature;
means for controlling said adjuster means in rsponse to said desired and actual compartment temperature so that said actual compartment temperature approaches said desired compartment temperature;
means for sensing another actual temperature at a predetermined compartment portion where the heat of the sun is radiated;
means for sensing the intensity of the sun light incident to said compartment;
means for comparing said sensed intensity with a reference intensity; and
means for compensating, when the output of said comparing means indicates that said sensed intensity is higher than said reference intensity, the operation of said controlling means in accordance with said another actual temperature.

4,291,750

SELECTIVE EXTRACTION HEAT STORAGE UNIT

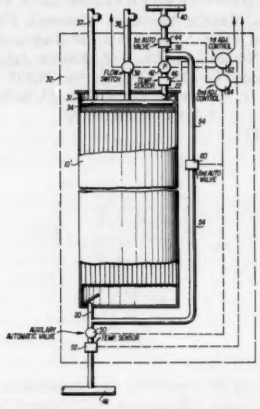
Arthur J. Clyne, Alma; John E. Knarr, Lansing, and Stanley Miller, Alma, all of Mich., assignors to Energy Recycling Company, Lansing, Mich.

Continuation of Ser. No. 23,216, Mar. 23, 1979, abandoned. This application Jul. 29, 1980, Ser. No. 173,256
Int. Cl.³ F28D *21/00*
U.S. Cl. 165—34 **13 Claims**

10. A heat storage assembly comprising:
a heat storage unit including at least one container having fusible substance therein and including a circulation system for allowing circulation of a heat transfer fluid from an external source heat through said unit, in contact with said containers;
a separate heat exchanger in said unit for contacting heat transfer fluid flowing through said unit, said separate heat exchanger comprising inlet and outlet tubes for allowing a separate fluid into and out of said separate heat exchanger;
an inlet pipe coupled to said unit for providing transfer fluid to said unit from said external source;
an exhaust pipe coupled to said unit for transporting heat transfer fluid away from said unit;

a bypass pipe mounted in parallel fluid flow relationship with said unit, said bypass pipe including a first valve therein for opening and closing said bypass pipe;

a second valve means for isolating the heat transfer fluid in said unit from said external source; and



a pump means for circulating heat transfer fluid through said bypass pipe and said unit to provide increased interchange of heat between said separate heat exchanger and said heat transfer fluid in said unit.

4,291,751

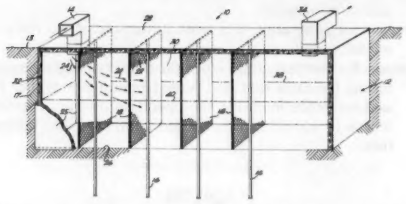
THERMAL INVERTER

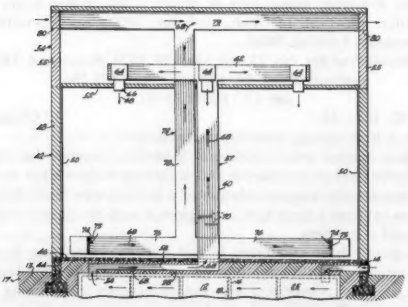
Bernard A. Wolf, 6514 Central Ave., St. Petersburg, Fla. 33707

Filed Aug. 16, 1979, Ser. No. 66,921

Int. Cl.[3] F25D *23/12;* **F23L** *17/02*

U.S. Cl. 165—45 **4 Claims**





1. A thermal inverter arrangement for year around regulating air temperatures of a building's interior by utilizing earth temperatures at predetermined depths below the earth's surface whereat a selected temperature range exits substantially year around, the thermal inverter arrangement comprising:

a plenum chamber adapted for being disposed underground;

said plenum chamber having an air inlet and an air outlet;

said plenum chamber having a plurality of metal screens disposed in traversing relationship to said plenum chamber between said air inlet and said air outlet;

a plurality of metal poles being mounted to each of the screens and positioned to extend downward from said screen to said predetermined depths;

said plenum chamber being constructed below the foundation of the house;

an exhaust duct mounted in the upper portions of the building having a pair of opposed ends disposed in fluid communication with the outside region with respect to the building;

a main duct having one end thereof opening into the interior of the building and the other end joining said exhaust pipe; whereby a draft is created through the main duct by natural air currents flowing through the exhaust duct;

said plenum chamber defining an interior cavity having a volume at least equal to one-fourth of the volume of the interior of the building to be cooled; whereby the air flowing through the plenum chamber, by thermal heat transfer between the air flow and the predetermined depths of the earth through said screens and poles, assumes desired temperatures.

4,291,752

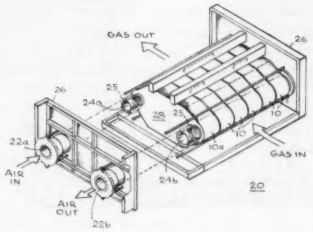
HEAT EXCHANGER CORE ATTACHMENT AND SEALING APPARATUS AND METHOD

David G. Bridgnell, 26963 Bolan La., Rolling Hills, Calif. 90274

Filed Oct. 26, 1978, Ser. No. 955,118

Int. Cl.[3] F28F *5/00*

U.S. Cl. 165—81 **13 Claims**



1. Heat exchanger coupling apparatus comprising:

first and second air passage defining members of thin sheet material, the members being adjacent one another but displaced therefrom and subject to disparate dimensional changes resulting from thermal growth;

a sealing member comprising a U-shaped circumferential metal bladder extending between said first and second members; and

means affixing the opposed ends of the sealing member in sealing relationship to respective adjacent edges of said first and second members.

4,291,753

SCRAPER ASSEMBLY FOR USE WITH A FLUIDIZED BED CONDENSER

Richard L. Fisher; David J. Wright, and Randall Scheel, all of Albany, Oreg., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 7, 1979, Ser. No. 9,940

Int. Cl.[3] F28G *3/10*

U.S. Cl. 165—94 **12 Claims**

1. A fluidized bed condenser for condensing zirconium

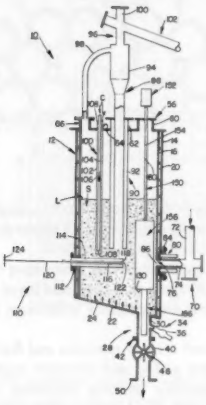
tetrachloride or hafnium tetrachloride to a free flowing solid comprising:

a vertically oriented water cooled vessel;

inlet means defined in a wall of said water cooled vessel for conducting fluid zirconium tetrachloride or hafnium tetrachloride into said water cooled vessel;

a fluidized bed in said water cooled vessel for condensing zirconium tetrachloride or hafnium tetrachloride vapor to a free flowing solid;

a heater surrounding said inlet means for maintaining zirconium tetrachloride or hafnium tetrachloride in a vapor state as those products enter said water cooled vessel, said



heater producing enough heat to maintain said zirconium tetrachloride or hafnium tetrachloride in a vapor state until such vapor enters said fluidized bed;

an unheated scraper means mounted on said vessel and located within said vessel only immediately adjacent said wall located inlet means, said scraper means being cooled by particles in said fluidized bed and including at least one arm and means connected to said arm for moving that arm, said arm dislodging solid zirconium tetrachloride or hafnium tetrachloride from adjacent and within said inlet to prevent solid build up in said inlet means; and

outlet means for conducting solids out of said vertical vessel, said solids being removed by gravity flow.

4,291,754

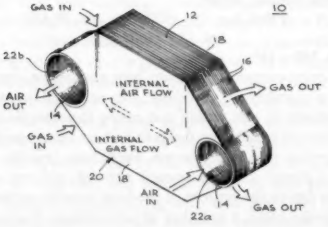
THERMAL MANAGEMENT OF HEAT EXCHANGER STRUCTURE

Calvin J. Morse, and Gabor Kossuth, both of Torrance, Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 26, 1978, Ser. No. 955,114

Int. Cl.[3] F28D *7/02*; F28F *3/08*

U.S. Cl. 165—165 **18 Claims**



1. In a heat exchanger core of the plate and fin type having integral manifolds and heat exchange portions, apparatus defining passages for directing portions of the heat exchanging fluids to selected portions of the heat exchanger about the periphery thereof comprising:

a plurality of air passages extending along a selected portion of the heat exchanger manifolds in heat conducting relationship therewith;

means for connecting said passages between inlet and outlet manifolds in heat exchanging relation with hot gas passages in the heat exchanger; and

means for connecting said passages with the interior of their associated manifolds at selected positions about the periphery of the manifolds for directing a portion of the compressed air conducted by the manifolds through said passages.

4,291,755

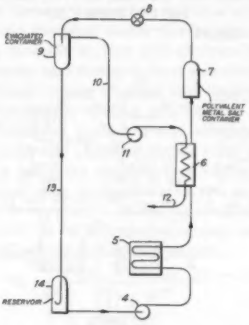
METHOD AND APPARATUS FOR ACCUMULATING, STORING AND RELEASING THERMAL ENERGY

Wallace L. Minto, Sarasota, Fla., assignor to Sun Power Systems Inc., Sarasota, Fla.

Filed Oct. 10, 1978, Ser. No. 949,593

Int. Cl.[3] F28D *13/00*

U.S. Cl. 165—3 **14 Claims**



1. The method of handling thermal energy comprising the steps of treating an energy storage medium including an at least partially hydrated heat storage water soluble polyvalent metal salt material having relatively hydrated and dehydrated states with thermal energy derived from a source thereof to extract and remove water from and convert said storage material to a water impoverished state, thereafter adding water to said water impoverished material to effect at least the partial rehydration thereof with the evolution of heat and applying said evolved heat to a heat consuming process.

4,291,756

HEAT ACCUMULATOR

Armand Bracht, 31, rue du Rhin, Kingersheim (Haut-Rhin), France

Filed Jul. 17, 1979, Ser. No. 58,199

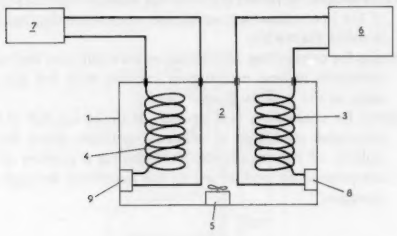
Claims priority, application France, Jul. 21, 1978, 78 22761

Int. Cl.[3] F28D *21/00*

U.S. Cl. 165—104.17 **7 Claims**

1. A heat accumulator comprising in combination a reservoir, a flowable storage mass within said reservoir, thermal insulation means enclosing said reservoir, heat-transfer means for introducing heat into said mass, heat recovery means for recovering heat from said mass, a stirrer to stir said mass, and

an electrical stirrer motor immersed in said mass for drawing said stirrer, said mass being a meltable organic compound



which is solid at room temperature and being electrically insulative and lubricative.

4,291,757

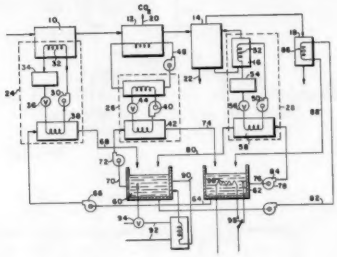
MULTIPLE HEAT PUMP AND HEAT BALANCING SYSTEM FOR MULTI-STAGE MATERIAL PROCESSING

George H. Redden, Staunton, Va., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 28, 1980, Ser. No. 153,991

Int. Cl.³ F28D *7/00*

U.S. Cl. 165—104.31 **7 Claims**



6. In an arrangement for providing heating and cooling in various stages of an ethyl alcohol plant including at least the main stages of cooking, cooling-fermentation, and distillation, a heating and cooling and heat balance system comprising:

first, second, and third heat pumps, each including a condensing section and an evaporating section;

a first, normally cooler fluid tank, and a second, normally warmer fluid tank;

means connecting the condensing sections of said first and third heat pumps in heat exchange relation with said cooking and distillation stages, respectively;

means connecting the evaporator section of said second heat pump in heat exchange relation with the cooling-fermentation stage;

means connecting said evaporator section of said first heat pump to receive fluid from said second tank and to return it to said first tank;

means connecting said condensing section of said second heat pump to receive fluid from said first tank and return it to said second tank;

means connecting said evaporator section of said third heat pump to receive fluid from said second tank and to return it to said first tank;

means to reject heat selectively from the fluid of said first tank, and to add heat selectively to said fluid of said second tank.

4,291,758

PREPARATION OF BOILING HEAT TRANSFER SURFACE

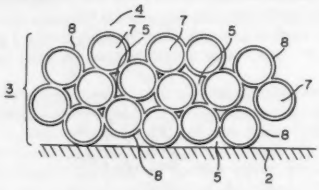
Masao Fujii; Yoshifusa Ogawa, and Yoshiyuki Morihiro, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1979, Ser. No. 81,438

Claims priority, application Japan, Oct. 31, 1978, 53-135979

Int. Cl.³ F28F *13/18*

U.S. Cl. 165—133 **3 Claims**



1. A boiling heat transfer surface for contacting with a liquid coolant, comprising a porous layer on a substrate, said porous layer formed of:

a layer of metallic particles having grain sizes of between 60 mesh pass and 250 mesh non-pass, said layer being at least one particle thick and defining interstices between said particles; and

a metallic film plated on said particles and fixing said particles to one another and to said substrate, said metallic film having a substantially uniform thickness on each said particle greater than 10μ but not sufficiently great to fill said interstices,

whereby said interstices form at least some of the pores of said porous layer.

4,291,759

CROSS-CURRENT TYPE PLATE HEAT EXCHANGER

Hiroyuki Sumitomo, Osaka, Japan, assignor to Hisaka Works, Limited, Osaka, Japan

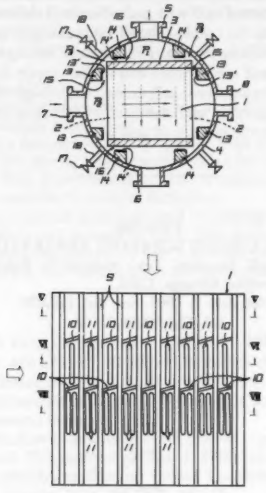
Filed Aug. 28, 1979, Ser. No. 70,631

Int. Cl.³ F28F *3/00*

U.S. Cl. 165—146 **2 Claims**

1. A cross-current type plate heat exchanger comprising a casing, a plurality of vertically disposed heat transfer plates arranged side by side within said casing to define fluid passageways through which two fluids to be heat exchanged flow in a cross-current manner, wherein each heat transfer plate includes a plurality of juxtaposed vertical grooves extending from the top to the bottom of the heat transfer surface of said heat transfer plate, a plurality of substantially horizontal projections positioned between the vertical grooves for dividing said heat transfer area into a plurality of sections, and vertically extending short projections which are lower than the vertical

grooves positioned between the substantially horizontal projections wherein the number of said short projections provided



in the vertically separated sections is progressively increased as the heat transfer area extends from top to bottom.

4,291,760

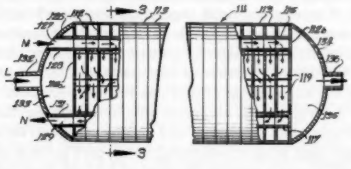
TWO FLUID HEAT EXCHANGER

Charles S. Argyle, Willowdale; Robert C. Bamsey, Kitchener, and Gregory S. T. Millard, Brampton, all of Canada, assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 918,197, Jun. 22, 1978, abandoned, which is a division of Ser. No. 716,628, Aug. 23, 1976, abandoned. This application Oct. 15, 1979, Ser. No. 85,093

Int. Cl.³ F28F *3/00*

U.S. Cl. 165—166 **10 Claims**



1. A two fluid heat exchanger comprising a series of flanged plates, each plate having a peripheral flange, a first fluid inlet opening, a first fluid outlet opening, and one or more elongated second fluid passage openings each defined by a flange, all of the flanges on each plate extending from one surface thereof and adapted to engage the unflanged surface of the next adjacent plate, said series of plates adapted to be stacked and suitably joined together to form the heat exchanger, a pair of end plates on the opposite ends of the stack, means to allow separate flow of said first and second fluids to said plates, and separate means communicating with said first fluid inlet and outlet openings and the space between said plates, said first fluid passing through said first fluid inlet opening in each of said plates and between said plates to the first fluid outlet openings.

4,291,761

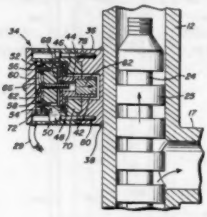
MAGNETIC SENSING DEVICE

Willie L. Watson, Fredericksburg, Ohio, assignor to Multi Products Co., Millersburg, Ohio

Filed Apr. 18, 1980, Ser. No. 142,374

Int. Cl.³ H01H *36/00*

U.S. Cl. 166—66 **10 Claims**



1. A magnetic proximity sensing device comprising; a movable magnet for sensing the proximity of an iron-containing object crossing the magnetic field of the magnet, a housing to secure said magnet and being movable therewith, said housing including an electrically conductive portion, said device including a means spaced from said electrically conductive portion capable of forming a complete electrical circuit when in contact with said electrical conductive portion, said magnet housing being movable so that said electrically conductive portion can engage said means to form said electrical circuit, and an adjustment means adjacent said magnet capable of maintaining said magnet housing at a location whereby said electrically conductive portion is out of contact with said means to complete said electrical circuit when said iron-containing object is not in the magnetic field of said magnet, said adjustment means being a magnetic set screw positioned adjacent said magnet, the position of said set screw relative to said magnet being able to be adjusted by turning said screw and thereby magnetically attracting said magnet.

4,291,762

APPARATUS FOR RAPIDLY ATTACHING AN INSIDE BLOWOUT PREVENTER SUB TO A DRILL PIPE

Howard S. Gudgel, Tulsa, Okla., assignor to Drill Tech Equipment, Inc., Tulsa, Okla.

Filed Jan. 18, 1980, Ser. No. 113,385

Int. Cl.³ E21B *19/16*

U.S. Cl. 166—85 **6 Claims**

1. An inside blowout preventer for a drill pipe, the drill pipe having an enlarged external diameter internally threaded upset end portion, comprising:

a blowout sub having a lower and threadably engageable with the drill pipe upset end;

a horseshoe member dimensioned to slidably engage a drill pipe below the upset end and slid on the pipe and be restrained by the upset end;

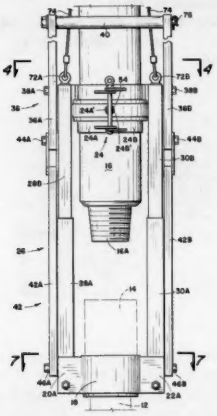
a collar attached to said blowout sub;

telescoping frame attached at its upper end to said collar and at the lower end to said horseshoe assembly;

an arm pivotally attached at an intermediate point to said collar, the arm having a hand engaging means at one end; and

a linkage pivotally attached at its first end to the other end of said arm, the second end of the linkage being pivotally attached to said horseshoe member, whereby said blowout sub is positioned above a drill pipe upset end, said horseshoe member may be engaged with the drill pipe and the pivotation of said handle move said collar downwardly towards said horseshoe member to engage the lower

threaded end of said blowout sub with the drill pipe upset end and the entire assembly rotated relative to the drill



pipe to thread said blowout sub into the drill pipe upset end.

4,291,763

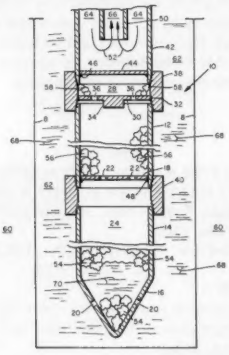
DISPENSER FOR OIL WELL TREATING CHEMICALS

Mortimer Singer, 2320 Plaza del Grande, Las Vegas, Nev. 89102

Filed Nov. 5, 1979, Ser. No. 91,468

Int. Cl.³ E21B *21/00, 43/12*

U.S. Cl. 166—110 **10 Claims**



1. In an oil well, including at least a conventional string of tubing, a string of sucker rods, a sucker rod pump including a traveling valve; and a standing valve; an apparatus for dispensing well treating chemicals over a selected period of time, while said sucker rod pump is pumping fluid from said well, said apparatus comprising;

(a) a closed cylindrical container having at least one chamber of selected diameter and of selected length; and means to removably rigidly attach said container to the bottom of said string of tubing, below the inlet of said sucker rod pump;

(b) at least one opening of selected size in the bottom end of said container;

(c) said container is at least partially filled with at least one piece of solid well treating chemical of selected chemical composition and attached to the the bottom of said tubing string; and

(d) means to reciprocate said container vertically through a selected distance, while said container is immersed in the well fluid standing in the bottom of said well;

whereby when said dispense is submerged in the well fluids in the bottom of said well; and when said sucker rod pump is operated, the bottom end of said tubing string and said dispenser will be vertically reciprocted through a selected distance; and well liquids will be alternately forced into, and withdrawn from, said container through said bottom opening, carrying said chemical into solution in the water standing in the bottom of said well.

4,291,764

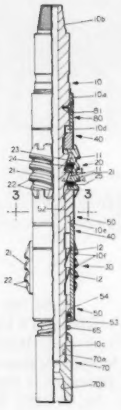
WELL CASING SCRAPING APPARATUS

Davy G. Pampell, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jan. 7, 1980, Ser. No. 110,078

Int. Cl.³ E21B *37/02*

U.S. Cl. 166—173 **13 Claims**



1. A well casing scraping apparatus, comprising: a generally cylindrical mandrel having means on one end thereof for connection to a conduit; at least one peripheral ramp surface formed on said mandrel; annular scraping means defined by a plurality of arcuate segments around said ramp surface portion of said mandrel, each segment having scraping teeth on its outer periphery and an internal arcuate ramp surface conforming to the adjacent portion of said peripheral ramp surface, whereby the engagement of said internal and peripheral ramp surfaces determines the minimum effective scraping diameter of the scraping means, each of said arcuate segments including an arcuate base portion overlying an arcuate portion of said ramp surface and a radially projecting integral body portion carrying said scraping teeth, said body portion being of shorter arcuate extent than said base portion whereby the edges of said base portion project arcuately beyond said body portion; a retaining sleeve mounted on said mandrel adjacent said scraping means, means on said retaining sleeve surrounding portions of said scraping means and limiting both radial and axial movements of said segments relative to said mandrel including axial projections of arcuate cross-section extending between said segment body portions and overlying the arcuately projecting edges of said segment base portions; resilient means intermediate said mandrel and each said segment to bias the segments radially outwardly to the extent permitted by said retaining sleeve; and means for adjusting the axial position of said retaining sleeve relative to said mandrel, thereby adjusting the minimum effective scraping diameter of said scraping means.

4,291,765
WATER FLOODING PROCESS USING MULTIPLE FLUIDS

Ralph E. Gilchrist, Corpus Christi; George W. Hover, Houston, and Robert M. Barber, Spring, all of Tex., assignors to Mitchell Energy Corporation, Houston, Tex.

Filed Aug. 2, 1979, Ser. No. 62,921
Int. Cl.[3] E21B *43/22*
U.S. Cl. 166—273 **16 Claims**

1. A method of recovering oil from an oil containing subterranean formation comprising:

injecting a first non-caustic treatment fluid consisting essentially of water and a polymeric viscosifier in an amount of 10 to 30% pore volume of the formation and driven by water into the formation, thereafter,

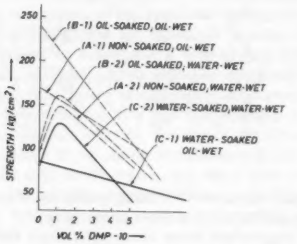
injecting a second treatment fluid containing a polymer and a caustic in an amount to 10 to 30% pore volume of the formation and driven by water into the formation, and

recovering an oil fraction from said subterranean formation.

4,291,766
PROCESS FOR CONSOLIDATING WATER-WET SANDS WITH AN EPOXY RESIN-FORMING SOLUTION

David R. Davies; Jacobus J. M. Zuiderwijk, and Adrianus M. P. M. Hagelaars, all of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 79,140, Sep. 26, 1979, abandoned. This application Jun. 2, 1980, Ser. No. 155,825
Claims priority, application United Kingdom, Apr. 9, 1979, 12475/79; Canada, Mar. 21, 1980, 348115
Int. Cl.[3] E21B *33/138, 43/04*
U.S. Cl. 166—276 **11 Claims**



1. A well treating process for consolidating a mass of contiguous particles within a subterranean location in or near the borehole of a well comprising:

compounding a resin-forming solution which consists essentially of (a) at least one polymerizable epoxy compound having an average of at least one epoxy group per molecule and at least one amino curing agent which contains at least three amino hydrogen atoms per molecule and is capable of curing the epxoy compound, (b) a volume ratio between the curing agent and epoxy compound of from about 0.2 to 0.6 and (c) a liquid oil solvent which contains aromatic and nonaromatic hydrocarbons in a volume ratio such that the solution remains ungelled while a partially cured epoxy resin is formed, precipitate from the solution, and substantially completely cured, within said subterranean location;

injecting at least one pretreatment fluid into the mass of particles to be consolidated to the extent required to wet those particles with an aqueous solution which is no more saline than the water then in said mass and contains not more than about 1.5% by weight dissolved salt;

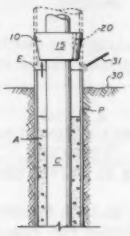
dissolving in said resin-forming solution and/or pretreatment fluid an amount of at least one dimethylaminomethyl-substituted phenol to provide a proportion of about 0.2 to 10% by volume of that phenol within the fluid in which it is dissolved; and,

injecting said resin-forming solution into the mass of particles to be consolidated in a rate and volume such that the solution enters the mass before a significant proportion of partially cured resin has precipitated and is kept within said mass at least substantially throughout the precipitating and curing of that resin.

4,291,767
METHOD FOR STABILIZING AND HANGING SURFACE CASING

Emmitt D. Hall, Jr., P.O. Box 822, Atlanta, Tex. 75551

Filed Feb. 6, 1980, Ser. No. 118,922
Int. Cl.[3] E21B *33/14, 41/00*
U.S. Cl. 166—290 **7 Claims**



1. A method of stabilizing surface casing in the earth's surface for well operations comprising the steps of:

a. positioning conductor pipe in the earth's surface;

b. lowering surface casing through the conductor pipe;

c. positioning cement between the conductor pipe and the surface casing;

d. elevating the surface pipe before the cement hardens;

e. positioning stabilizer and hanger means with a downwardly tapered annular outer surface and a serrated inner annular surface around the surface casing whereby the serrated inner surface engages the surface casing; and

f. lowering the surface casing and stabilizer and hanger means thereon into the conductor pipe whereby the tapered outer surface and the weight of the surface pipe flare the upper end of the conductor pipe to form a bowl for receiving, seating and supporting the stabilizer and hanger means to thereby secure the surface casing to the conductor pipe and hence the surrounding earth's surface to stabilize the surface casing for well operations.

4,291,768
PACKING ASSEMBLY FOR WELLHEADS

Robert J. Diehl, Wallis, Tex., assignor to W-K-M Wellhead Systems, Inc., Shreveport, La.

Filed Jan. 14, 1980, Ser. No. 111,760
Int. Cl.[3] E21B *33/02*
U.S. Cl. 166—315 **8 Claims**

1. In a wellhead assembly, the combination of:

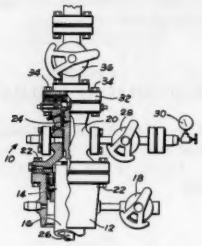
a tubing head having an inner peripheral surface including an inner annular supporting shoulder;

a tubing hanger supported on said supporting shoulder and having an outer peripheral surface spaced from the inner peripheral surface of said tubing head to define an annular space therebetween;

holddown means to seat said tubing hanger tightly on said annular shoulder of said tubing head; and

a packing assembly mounted within said annular space comprising a plurality of lower packing rings, an upper annular piston member mounted over the packing rings for downward movement to compress the packing rings, and cooperating retaining means on said piston member and the outer periphery of said tubing hanger to lock said

piston member to said tubing hanger after the piston member moves downwardly a predetermined amount and



compresses the packing rings thereby to retain the packing rings in a compressed relation on the tubing hanger.

4,291,769

FOAM FIRE EXTINGUISHING UNIT FOR RESCUE VEHICLE

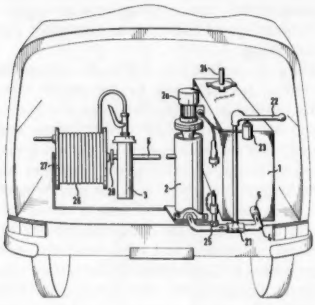
Erich Müller, Saumweg 15, D-7918 Illertissen, Fed. Rep. of Germany

Filed Oct. 22, 1979, Ser. No. 87,266

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 2846150

Int. Cl.[3] **A62C** *27/06*

U.S. Cl. 169—13 **1 Claim**



1. A quick-use foam fire extinguishing unit, comprising:

a container;

a premanufactured mixture of water and a conventional watery film-forming foam medium in said container;

a tubelike filling pipe mounted on an upper wall of said container for facilitating a filling of said container with said mixture;

an outlet adjacent a bottom wall of said container;

a pump having an inlet at the bottom end thereof and an outlet spaced upwardly from said inlet;

a first outlet pipe connected to and extending between said outlet in said container and said inlet to said pump;

a valve in said first outlet pipe between said container outlet and said inlet to said pump;

a hand operated lever operatively connected to said valve for facilitating an opening and closing of said valve, said lever extending upwardly from the valve to a position above the top of the container with a horizontal portion extending along the top of the container;

A switch mounted adjacent the top of said container adjacent said hand operated lever, said switch being actuated in response to a movement of said lever to a position corresponding to said valve being opened, wherein the horizontal portion directly abuts the switch for operation thereof;

a motor operatively connected to said pump and electrically connected to said switch, said motor being actuated in response to said switch being actuated to thereby effect a driving of said pump;

a hose reel having an inlet at the center thereof;

a second outlet pipe connected to and extending between said pump outlet and said inlet on said hose reel;

an elongated hose on said hose reel connected in fluid communication with said inlet on said hose reel;

a hand held jet pipe connected to a free end of said hose and being movable independently of said hand operated lever; and

a connection branch in said first outlet pipe located between said valve and said inlet to said pump and being adapted for connection to a water supply hose for cleaning said pump, said second outlet pipe and said hose following a use thereof with said mixture.

4,291,770

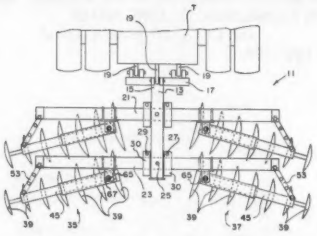
LEVEE DISC APPARATUS

Louis C. Engler, Wilburn Rte., Box 382, Heber Springs, Ark. 72543

Filed Jan. 16, 1980, Ser. No. 112,555

Int. Cl.[3] **A01B** *21/08*

U.S. Cl. 172—185 **3 Claims**



1. A disc apparatus for being pulled by a tractor and for forming levees, said apparatus comprising:

(a) a longitudinal frame member having a forward end for being attached to said tractor;

(b) a first cross frame member pivotally attached to said longitudinal frame member substantially transverse thereof;

(c) a first disc blade gang including a first disc blade set attached to said first cross frame member on a first side of said longitudinal frame member and a second disc blade set attached to said first cross frame member on a second side of said longitudinal frame member;

(d) a second cross frame member pivotally attached to said longitudinal frame member substantially transverse thereof and rearward of said first cross frame member;

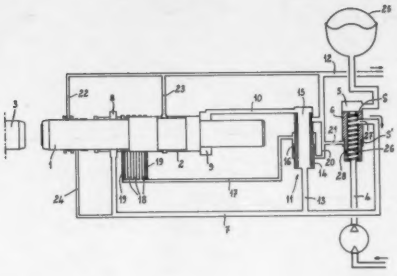
(e) a second disc blade gang including a first disc blade set attached to said second cross frame member on a first side of said longitudinal frame member and a second disc blade set attached to said second cross frame member on a second side of said longitudinal frame member; each of said disc blade sets including a plurality of disc blade members with each blade member having a different outside diameter and with the outside diameter of each blade member increasing at a substantially uniform rate from said blade member farthest from said longitudinal frame member to said blade member closest to said longitudinal frame member; and

(f) stop means for limiting pivotal movement of said first and second cross frame members on said longitudinal frame member to a range of substantially 15°.

4,291,771
ROTARY PERCUSSION HYDRAULIC DRILLING MACHINE

Raymond J. Perraud, Villeurbanne, France, assignor to Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A. Societe Anonyme, Meyzieu, France

Filed Mar. 23, 1979, Ser. No. 23,325
Claims priority, application France, Jun. 20, 1978, 78 18936
Int. Cl.[3] E21C *3/20*
U.S. Cl. 173—106 1 Claim



1. In a hydraulic drilling machine comprising a percussion-controlling striker piston mounted to slide inside a cylinder and drive a tool, said cylinder defining, around the piston, a first annular chamber connected by a "high pressure" pipe to a one-way valve in the form of a sleeve subject to a spring force and slidably mounted inside a chamber which is connected to an acumulator comprising a diaphragm and leading to which is a hydraulic fluid inlet pipe and a second annular chamber connected to a control valve with a slide having differential sections connecting said second chamber alternately to the "high pressure" pipe and a return pipe, the control of the control valve being ensured by a pipe connected to the cylinder, the improvement wherein the sleeve constituting the one-way valve has a lateral connection allowing direct passage of the hydraulic fluid to the return pipe, when said valve is in a position preventing the passage of fluid to the "high pressure" pipe, a hydraulic rotary motor for rotating said tool being located in the inlet pipe.

4,291,772
DRILLING FLUID BYPASS FOR MARINE RISER

Pierre A. Beynet, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 25, 1980, Ser. No. 133,703
Int. Cl.[3] E21B *7/12, 17/01, 21/08*
U.S. Cl. 175—5 18 Claims

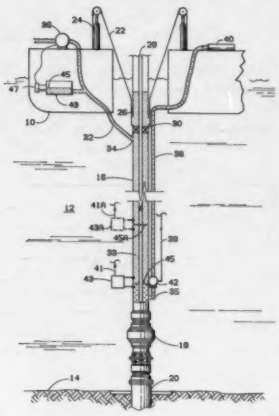
17. A method of drilling a subsea well from a vessel floating on a body of water in which a drilling fluid is circulated down a drill pipe to a drill bit and returned up the annulus between a drill string and the borehole wall, the improvement which comprises:

providing a riser pipe from said wellhead to said vessel;

maintaining a lightweight fluid other than air in said riser on top of the drilling fluid in said annulus;

said lightweight fluid having a density less than said drilling fluid; and

connecting the annulus below said lightweight fluid to a return conduit extending to said vessel.

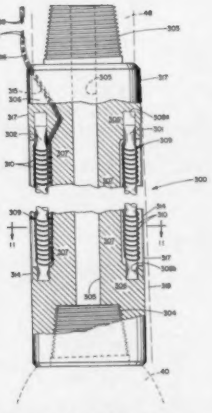


18. A method as defined in claim 17 in which said lightweight fluid is sea water.

4,291,773
STRICTIVE MATERIAL DEFLECTABLE COLLAR FOR USE IN BOREHOLE ANGLE CONTROL

Robert F. Evans, 631 Honeywood La., La Habra, Calif. 90631

Continuation-in-part of Ser. No. 928,703, Jul. 27, 1978, Pat. No. 4,211,292. This application Dec. 10, 1979, Ser. No. 101,854
Int. Cl.[3] E21B *7/04*
U.S. Cl. 175—61 24 Claims



1. A deflectable collar adapted to be connected to a drill string in drilling apparatus, comprising:

at least one strictive material element operatively connected to said deflectable collar to deflect said collar under the influence of energizing force applied to said strictive material element, said strictive material element having the characteristic of changing in length in at least one dimension under the influence of an energizing force applied to said element; and

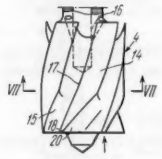
means operatively associated with said strictive material element for applying an energizing force to said strictive

material element of sufficient strength to change the length of said strictive material element.

4,291,774
ROCK-BREAKING IMPLEMENT FOR PERCUSSIVE MACHINES

Boris V. Sudnishnikov, Krasny prospekt, 56, kv. 59; Veniamin V. Kamensky, ulitsa Derzhavina, 19, kv. 78; Eduard P. Varnello, ulitsa Dzerzhinskogo, 3, kv. 19, and Sergei K. Tupitsyn, ulitsa Zorge, 123, kv. 31, all of Novosibirsk, U.S.S.R.

Filed May 30, 1979, Ser. No. 43,834
Int. Cl.³ E21C *13/08*
U.S. Cl. 175—417 **13 Claims**



1. A rock-breaking implement, preferably for a self-propelled percussive machine for driving boreholes, comprising a body whereof at least a part facing a borehole face is cylindrical in shape:

rock-breaking wedges on said body arranged in such a manner that blades of the wedges extend radially at an end face of said body facing the borehole face;

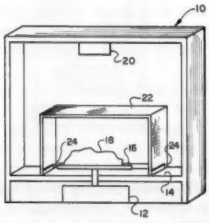
grooves in said body which open outside to the periphery of said body to remove broken rock, said grooves extending along helical lines and intersecting one another in such a manner that portions of said body located between said intersecting grooves define said rock-breaking wedges;

edges of said rock-breaking wedges, which extend on the periphery of said body within the cylindrical part thereof defining a continuous circle when projected to a plane of transverse section of said body and forming walls of the borehole.

4,291,775
METHOD AND APPARATUS FOR IMPROVING WEIGHING ACCURACY

Michael J. Collins, Matthews, N.C., assignor to CEM Corporation, Indian Trail, N.C.

Filed Nov. 1, 1979, Ser. No. 90,286
Int. Cl.³ G01G *21/28*
U.S. Cl. 177—1 **9 Claims**

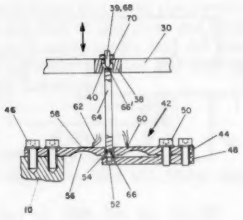


1. A method for improving analytical balance accuracy in weighing heated materials comprising placing a material to be weighed on the balance plate of an analytical balance, covering and enclosing said balance plate without contacting the same with a preformed air barrier transparent to microwave radiation heating said material with microwave radiation while on said balance to remove volatiles, collecting and/or absorbing said volatiles on said barrier and sensing the weight of said heated material while at a temperature above ambient temperature.

4,291,776
SCALE WITH CANTILEVER BEAM STRAIN MEASUREMENT

Walter Kupper, Madison, N.J., and Diethelm Utzinger, Zurich, Switzerland, assignors to Mettler Instrumente AG, Greifensee-Zürich, Switzerland

Filed May 17, 1979, Ser. No. 39,953
Int. Cl.³ G01G *3/08, 3/14*
U.S. Cl. 177—229 **10 Claims**



1. In a scale having load supporting means including a load receiving member for receiving a load to be weighed, and means for supporting said load receiving member;

improved measuring apparatus comprising, in combination,

a cantilever beam having an upper surface facing said load receiving member, a longitudinal axis, an anchored end, a free end portion, and a bore intersecting said longitudinal axis;

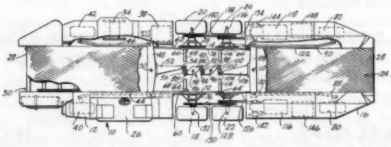
sensing means positioned on said upper surface for sensing strains set up in said cantilever beam; and

means for transmitting force from said load receiving member to said cantilever beam, said force transmitting means comprising a first force transmitting member releaseably coupled to said cantilever beam from beneath and having a portion aligned with said bore, and a second force transmitting member passing with clearance through said bore for transmitting force from said load receiving member to said first force transmitting member.

4,291,777
SHUTTLE CAR

Boyd R. Yale, Keen Mountain, Va., assignor to Island Creek Coal Co., Lexington, Ky.

Filed Aug. 23, 1979, Ser. No. 68,976
Int. Cl.³ B60P *1/38;* B62D *53/00, 61/10*
U.S. Cl. 180—24.06 **9 Claims**



9. An articulated mine-haulage vehicle comprising:

(a) a body member comprising a first elongated body section having first side walls, a second intermediate body section having second side walls, and a third elongated body section having third side walls, said first elongated body section providing at a first end thereof, a first pair of steering wheels, and connected at the first side walls at an end opposed to the first end thereof by a first hinge tube in articulating relation to the second side walls of a first end

of the second intermediate body section to form a first point of transverse articulation, said intermediate body section connected at the second side walls at a second end opposed to the first end thereof by a second hinge tube in articulating relation to the third side walls at a first end of the third elongated body section to form a second point of transverse articulation spaced from the first point of transverse articulation, the third elongated body section providing at a second end opposed to the first end thereof a second pair of steering wheels, said body member including conveying means for loading, carrying, and discharging mined materials;

(b) a first pair of driven wheels having a common axis of rotation coupled to the second side walls of said second intermediate body section, the axis of rotation of the first pair of driven wheels being spaced above and adjacent the first point of transverse articulation and between the first and second points of transverse articulation;

(c) a second pair of driven wheels having a common axis of rotation coupled to the third side walls of said third elongated body section, the axis of rotation of the second pair of driven wheels being spaced above and adjacent the second point of transverse articulation and between said second point of transverse articulation and said second pair of steering wheels; and

(d) means to drive said first and second pair of driven wheels.

4,291,778

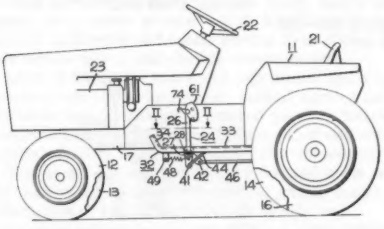
FOOT PEDAL ARRANGEMENT FOR A MOTOR VEHICLE

John J. Slazas, Cedarburg, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 957,715, Nov. 6, 1978, abandoned, which is a continuation of Ser. No. 754,342, Dec. 27, 1976, abandoned. This application Feb. 22, 1980, Ser. No. 123,737

Int. Cl.³ G05G *1/16, 5/06*

U.S. Cl. 180—271 **6 Claims**



1. In a tractor having a main frame and an operator's station, the combination comprising:

a floor secured to and disposed at one lateral side of said main frame, said floor having a horizontal portion and an upwardly inclined portion at the forward end of said horizontal portion, said inclined portion terminating at its front end in a downwardly and forwardly inclined lip, the edge of which extends in a transverse direction,

a brake lever pivotally mounted on said tractor for swinging movement about a first transverse axis between a raised brake released position and a lowered brake applied position including an upstanding portion and an arm extending transversely from the upper end of said upstanding portion,

means resiliently biasing said lever toward its brake released position,

a foot pedal mounted on said arm for limited pivotal movement about a second transverse axis including a hook on said pedal substantially as wide as the axial width of said foot pedal adapted to engage said lip when said lever is pivoted to its brake applied position and said pedal is pivoted in one direction about said second axis, whereby a parking brake function is achieved, said lip on said floor being of greater transverse dimension than the width of said hook, said foot pedal including wall means defining a cylindrical opening through which said arm extends and an axial groove in said cylindrical opening, and

a resilient member in said groove in resilient engagement with said arm releasably holding said foot pedal in selected positions of pivotal adjustment on said arm.

4,291,779

WHEEL-MOUNTED HYDRAULIC DRIVE SYSTEM

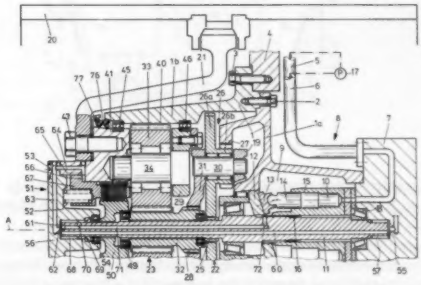
Egon Mann, and Helmut Eymüller, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 13, 1979, Ser. No. 57,173

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 2831458

Int. Cl.³ B60K *7/00*

U.S. Cl. 180—305 **10 Claims**



1. A wheel-mounted drive system comprising:

a hollow nonrotatable housing adapted to be mounted directly and substantially immovably on a vehicle frame;

a hydraulic motor mounted in said housing and having a motor output centered on an axis;

a transmission mounted in said housing and having

a transmission input sun gear connected to said motor output and centered on said axis,

a ring gear centered on said axis and fixed on said housing,

planet gears meshing with said ring and sun gears, and

a planet carrier carrying said planet gears and constituting a transmission output centered on said axis and

connectable directly to a drive wheel; and

a bearing rotatably mounting said transmission output directly on said housing and having an inner race directly engaging said output, an outer race directly engaging said housing, and roller elements between said races.

4,291,780

APPARATUS FOR WIRES IN THE GROUND

Earl Fulkerson, 4917 3A Street E, Gulf Lake Estates, Bradenton, Fla. 33507

Continuation-in-part of Ser. No. 11,875, Feb. 13, 1979, Pat. No. 4,244,437. This application Jan. 15, 1980, Ser. No. 112,394

Int. Cl.³ G01V *1/147, 1/047*

U.S. Cl. 181—121 **2 Claims**

1. An anvil useful for generating waves in the ground, comprising:

a body having a ground-engaging surface on the lower side thereof and impact receiving surface means on the upper side thereof, said impact-receiving surfaces including a pair of opposed impact-receiving surfaces each disposed in planes 90° apart and including a third impact-receiving surface being disposed parallel to the lower surface of said

body and at a generally 45° relationship with respect to said opposed impact-receiving surfaces.

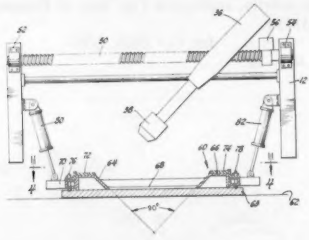
2. Apparatus for generating waves in the ground, comprising:

a frame;

an elongated, linear rigid boom movably mounted on the frame;

a hammer mounted on the boom for movement therealong;

an anvil mounted on the ground beneath the frame in a position thereto to be struck by the hammer, said anvil having a ground-engaging surface on the lower side thereof and impact-receiving surface means on the upper side thereof, said impact-receiving surface means including a pair of opposed impact receiving surfaces, disposed in planes about 90° apart;



cable means mounted on the boom and connected to the hammer for dropping it from an elevated position to strike the anvil;

positioning means mounted on the frame and connected to the boom for positioning it in a first position with respect to the frame to guide the hammer for a downward motion in a first direction toward the anvil, said positioning means being operative to move the boom with respect to the frame to a second position thereto to guide the hammer for a downward motion in a second direction toward the anvil whereby the hammer is operative to generate a wave in the ground by a downward motion in either said first direction or said second direction without repositioning the frame or the anvil with respect to the ground; and

hydraulic means carried on the frame and connected to the anvil for applying a portion of the weight of the frame and the boom on the anvil to position it on the ground.

4,291,781

SPEAKER DIAPHRAGM AND METHOD OF PREPARATION OF THE SAME

Hirotoshi Niguchi, Kashihara, and Mitsuru Ieki, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 16, 1979, Ser. No. 85,204

Claims priority, application Japan, Oct. 17, 1978, 53/128168; Feb. 9, 1979, 54/14742; Mar. 13, 1979, 54/28992; Mar. 20, 1979, 54/32693

Int. Cl.³ G10K *13/00*

U.S. Cl. 181—169 **9 Claims**

1. A diaphragm for a speaker, comprising a sheet, papermade of polyethylene short fibres being present in an amount of 70% by weight or more, said polyethylene short fibers having a degree of beating of 250 ml (Canadian Freeness), a melt index of not more than 2 g/min. and being no. more than 1 millimeter in length and other short fibres between 3 and 10 millimeters in length which have a modulus of elasticity of at least 1.1×10^{10} dyne/cm^2, said polyethylene short fibers being melted to bond with said other short fibres in said sheet; and said diaphragm having a cone or dome shape imparted by pressing while hot.

4,291,782

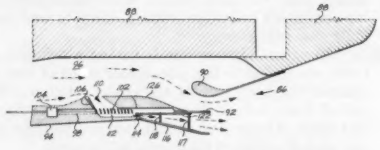
SIMPLIFIED METHOD AND APPARATUS FOR HOT-SHIELD JET NOISE SUPPRESSION

Garry W. Klees, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 30, 1979, Ser. No. 89,693

Int. Cl.³ F02K *1/00*

U.S. Cl. 181—215 **13 Claims**



9. Means for suppressing the noise of a jet engine having an exhaust duct through which passes a hot exhaust flow, comprising,

means forming a shield duct open to the atmosphere at an exit end thereof at least part way around the circumference of said exhaust duct,

means upstream of the exit of said shield duct for reducing the pressure of a fluid flow passing therethrough, and

means for permitting at least some of said exhaust flow to enter said shield duct means, whereby said flow passes through said pressure reducing means and is then expelled to the atmosphere to form a noise suppressing fluid shield layer.

4,291,783

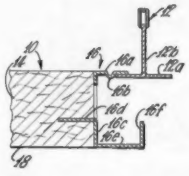
ACOUSTICAL PANEL FOR SUSPENDED CEILINGS

David A. Harris, Sylvania, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 973,309, Dec. 26, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 141,871

Int. Cl.³ E04B *1/82*

U.S. Cl. 181—295 **3 Claims**



1. An acoustical ceiling panel suitable for mounting on a suspended grid of inverted T-bars and comprising a generally rectangular fibrous glass board, a generally channel-shaped metal frame surrounding the board, and a decorative covering adhesively secured to a lower surface of the board and to a lower surface of the frame, the frame on each edge of the board including a body portion engaging the adjacent edge of the board and having a plurality of tabs projecting into the board entirely above the lower surface thereof, the tabs being spaced from each other longitudinally of the body portion and having been sheared and bent out from the remainder of the body portion and forming the main support for the board, an outwardly extending upper flange portion adapted to overlap a head portion of one of the inverted T-bars of the grid, an outwardly extending lower flange portion having its lower surface flush with the lower surface of the board whereby backings for the decorative covering provided by the board and by the frame are coplanar, and an upturned free end portion on the lower flange portion, the upturned free end portion being substantially aligned with the trunk portion of the re-

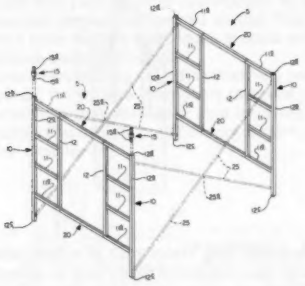
spective one of the inverted T-bars when the panel is properly positioned with respect thereto.

4,291,784

COMPACT, QUICK ASSEMBLY SCAFFOLD

Owen L. Moses, 315 Oregon Trail, Monroe, La. 71202

Filed Mar. 14, 1980, Ser. No. 130,546
Int. Cl.³ E04G 1/14
U.S. Cl. 182—178 **1 Claim**



1. A ladder unit for use in constructing a scaffold comprising:

a. an outside vertical member having a top and a bottom end, said top end and said bottom end being rectangular in cross-section and hollow for receipt of a pin means therein for joining one of said ladder units vertically to another of said ladder units;

b. an inside vertical member;

c. pin means comprising a rigid elongated structure having two end portions adapted to be slidably and snugly received in said hollow top or bottom end of said outside vertical member, said end portions being rigidly connected to a center portion which is sufficiently large enough to prevent said center portion from sliding into said hollow ends of said outside vertical member;

d. a series of horizontal two-ended step means rigidly connected at one end to said outside vertical member and at the other end to said inside vertical member, the steps located at said top end and said bottom end of said outside vertical member being rectangular in cross-section and hollow at said end which is connected to said inside vertical member for receipt of horizontal joining means for joining two of said ladder units side by side; and

e. horizontal joining means comprising a rigid elongated structure having two end portions adapted to be slidably and snugly received in said hollow ends of said step means at the top or bottom end of said outside vertical member, said two end portions being rigidly connected to an elongated center portion which is sufficiently large enough to prevent said center portion from sliding into said hollow ends of said outside vertical member and sufficiently long enough to achieve the desired horizontal spacing between two connected side-by-side ladder units.

4,291,785

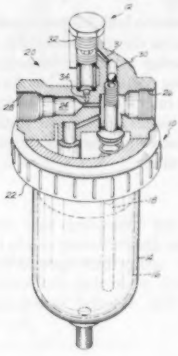
OIL METERING APPARATUS FOR AIR LINE LUBRICATORS

Edward A. Matysak, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 10, 1979, Ser. No. 65,409
Int. Cl.³ F16N 7/34
U.S. Cl. 184—55 A **5 Claims**

1. In a compressed air line lubricator for supplying lubricant to pneumatically operated machines and tools including a bowl for retaining a supply of lubricant, a main body attached to the top of said bowl, an air passage through said main body and a siphon tube for passing lubricant from said bowl to said main body, the improvement comprising

means for passing a precise quantity of lubricant from said main body to said air line including a metering body removably secured in said main body, said metering body having a cylindrical bore of predetermined diameter therethrough; a metering pin, having a cylindrical body of a predetermined diameter less than the diameter of said bore and a head of a diameter greater than the diameter of said bore; a cylindrical washer having an opening therein



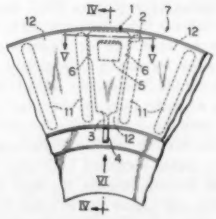
of a diameter greater than the diameter of said pin body and less than the diameter of said pin head, said washer being located between and separating said pin head and said metering body when said pin is inserted in said bore; and means for retaining said pin in said bore while permitting said pin limited motion with respect to said metering body responsive to pressure changes within said main body; whereby precise amounts of lubricant are dispensed between the pin body and the bore and movement of the pin within the bore prevents clogging.

4,291,786

BALANCING PIECE FOR VENTILATED BRAKE DISCS

Sadayoshi Ito, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 24, 1979, Ser. No. 88,066
Claims priority, application Japan, Jun. 9, 1979, 54-78843[U]
Int. Cl.³ F16D 65/10
U.S. Cl. 188—218 A **5 Claims**



1. In a ventilated brake disc including therein a number of radially disposed cooling vents each having a width continuously increasing toward an outer edge of said disc and being provided with rounded portions at corners, a balancing piece fixedly received within said vents for improving rotational balance of said disc, comprising as integral parts thereof:

(a) a wide portion both edges of which are put into contact with said rounded portions at said both ends of said vent when said balancing piece is inserted into the vent in

parallel to said width of the vent through an open end of the vent at said outer edge of said disc to a predetermined depth;

(b) at least one tab portion formed adjacent to said wide portion and protruding at an acute angle relative to a surface of a wide end portion of said balancing piece, top edge of said at least one tab portion being forcibly in abutment with an internal surface of said vent when said balancing piece is inserted in position thereby preventing said wide portion from shifting away from said rounded portions; and

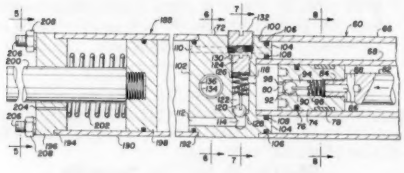
(c) a locking portion which is projected through an open end of said vent on the disc center side when said balancing piece is inserted to said predetermined depth, said projected locking portion being put into engagement with an edge of said internal surface of said vent at said open end on said disc center side thereby restraining said balancing piece from moving radially outwardly toward said outer edge of the disc.

4,291,787

EXERCISING DEVICE WITH DOUBLE ACTING HYDRAULIC CYLINDER

Jerry D. Brentham, P.O. Box 599, Belton, Tex. 76513

Filed Feb. 16, 1979, Ser. No. 12,874
Int. Cl.[3] A63B *21/00*; F16F *9/18*
U.S. Cl. 188—318 **7 Claims**



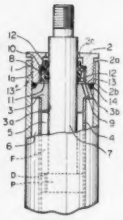
1. A double acting hydraulic cylinder, comprising: an inner tube disposed within an outer tube; head and base members closing the ends of said tubes, each head and base member having a passageway for placing fluid disposed within the inner and outer tubes in fluid communication; a piston slideably mounted within the inner tube for acting on the fluid disposed therein, said piston having a passageway extending therethrough for placing the fluid on one side of the piston into fluid communication with the fluid on the other side; a piston rod for moving the piston mounted with the piston and extending through the head member and for displacing fluid in the inner tube; first valve means mounted with said base member for preventing fluid communication through the base member passageway when said piston moves toward the base member; second valve means mounted with said piston for preventing fluid communication through the piston passageway when said piston moves toward the head member, the valves and piston rod coacting so that upon movement of said piston fluid in said inner tube always flows through the head member passageway from the inner to the outer tube; and means to adjust flow of fluid through the passageway in the head member for controlling the quantity of fluid flow from the inner tube into the outer tube to adjust the magnitude of force necessary to move the piston in either direction.

4,291,788

CYLINDER HEAD

Tetuo Kato, Musashino, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 896,150, Apr. 13, 1978. This application Feb. 11, 1980, Ser. No. 120,646
Claims priority, application Japan, Apr. 19, 1977, 52-49184
Int. Cl.[3] F15B *15/22*; F16F *5/00, 9/00*
U.S. Cl. 188—322.17 **4 Claims**



1. A dual tube type device such as a hydraulic shock absorber or the like, said device comprising; an outer tube having a closed lower end and an open end; an inner tube coaxial with the outer tube and having an open upper end and further having a piston slidable therein with damping force generating means therein and a piston rod on said piston extending out of the open ends of said tubes; a rod guide closing the upper end of the inner tube and having said piston rod extending therethrough in sliding engagement therewith; a closure member threadedly engaged with the upper end of the outer tube and through which the piston rod extends in sliding sealing engagement therewith and, in the fully threadedly engaged position, engaging said rod guide for holding it in said inner tube; pressurized fluid contained in the device; and an escape passage means for releasing the pressurized fluid during removal of said closure member from the device, said means including an escape passage one end of which is permanently open to the outside of said device and seal means provided between said closure member and the remainer of said device adjacent the other end of said escape passage and engaged by the inner end of said closure member for sealing the escape passage means from a space within the device when said closure member is fully threadedly engaged with said outer tube in a normally fully assembled position and said escape passage being open to the space within the device only when said closure member has been displaced in a direction outward toward the open end of the outer tube during removal of said closure member from said device.

4,291,789

HYDRAULIC SLACK ADJUSTING APPARATUS

Thomas M. Bogenschutz, Clayton, and Glen O. Bohusch, Watertown, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Nov. 19, 1979, Ser. No. 95,884
Int. Cl.[3] F16D *65/74*
U.S. Cl. 188—351 **7 Claims**

1. A hydraulic slack adjusting apparatus for controlling the slack fluid in a hydraulic circuit having a predetermined maximum slack, said apparatus comprising:

(a) a cylinder having first and second variable volume pressure chambers, the maximum volume of said second chamber defining the predetermined maximum slack fluid in the hydraulic circuit;

(b) first and second ports respectively operatively associated with the first and second chambers for permitting fluid to enter and leave the respective chambers;

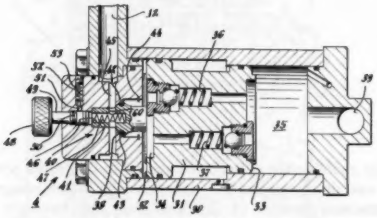
(c) a reciprocating piston movably mounted within the cylinder and dividing the cylinder into the first and second chambers;

(d) a normally closed slack makeup valve for opening and establishing fluid communication between the first and second chambers when fluid pressure in the first chamber exceeds fluid pressure in the second chamber by a first predetermined pressure differential so that additional fluid can flow from the first port through the second port in order to add fluid when the slack fluid is less than the predetermined amount;

(e) a normally closed slack take-in valve for opening and establishing fluid communication between the first and second chambers when fluid pressure in the second chamber exceeds fluid pressure in the first chamber by a second predetermined pressure differential so that fluid can be withdrawn from the hydraulic circuit in order to increase the maximum slack therein; and

(f) a hydraulic slack limiting valve for selectively preventing or permitting the withdrawal of more than said predetermined maximum amount of slack fluid including

a stationary valve seat disposed between the first port and the first chamber, and



a movable valve element having a sealing surface for engaging said stationary valve seat in a fluid tight seal to prevent fluid from flowing between the first chamber and the first port when the movable valve element is seated on said stationary valve seat, said movable valve element being spring biased away from said stationary valve seat, toward said piston and extending into said first chamber in the path of said piston in order to allow fluid in the first chamber to freely pass through the first port, whereby said movable valve element is acted upon and moved by said piston as said piston moves adjacent said first port and sealingly engages said stationary valve seat before said slack take-in valve can open thereby preventing more than the predetermined amount of slack fluid from being withdrawn from the circuit, and

means for acting upon said movable valve element to hold said sealing surface thereof disengaged from said stationary valve seat irrespective of the position of said piston, thereby permitting more than the predetermined amount of fluid to be withdrawn from the hydraulic circuit when the take-in valve opens.

4,291,790

TORQUE CONVERTER CLUTCH AND VIBRATION DAMPER

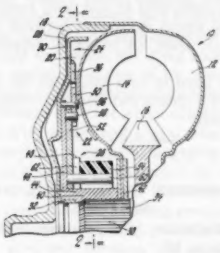
Vincent M. Staub, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1980, Ser. No. 131,924

Int. Cl.[3] F16H *45/02*; F16D *3/14*

U.S. Cl. 192—3.28 **4 Claims**

1. A torque converter clutch and torsional vibration damper comprising: a clutch pressure plate adapted to frictionally engage the input member of a torque converter; an output hub adapted to be drivingly connected to the output shaft of a torque converter and including a plurality of circumferentially spaced radial slots; an internally toothed gear member secured to said clutch pressure plate; a plurality of circumferentially spaced pinion gears rotatably mounted on said output hub and meshing with said internally toothed gear member; a plurality of circumferentially spaced link members connected between each respective pinion gear and radial slot, said connection at said pinion gear being pivotal and displaced radially from the center of said pinion gear toward the center of said output hub when the clutch is not transmitting torque; and an elastomeric belt operatively connected to said link members adjacent said



radial slot connections, said elastomeric belt exerting an increasing force on said pinion gears through said link members as torque transmission through said torque converter clutch increases and said elastomeric belt being operable to permit relative angular displacement between said clutch pressure plate and said output hub.

4,291,791

FREE WHEEL HUB MECHANISM

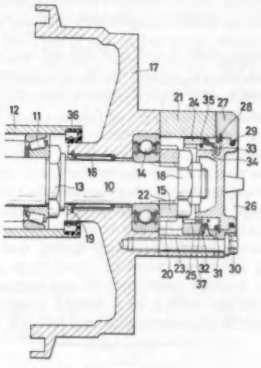
Hiromi Goto, Chiryu, and Kenji Ojima, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 1, 1979, Ser. No. 90,142

Claims priority, application Japan, Nov. 13, 1978, 53-139960

Int. Cl.[3] F16D *11/00*

U.S. Cl. 192—67 R **1 Claim**



1. A free wheel hub mechanism for a wheel comprising:

a housing member;

an axle shaft disposed within said housing member;

a body member secured to said wheel;

an interengaging member connected to said axle shaft so as to be rotatable therewith;

clutch means slidably mounted within said body member for engaging with and disengaging from said interengaging member;

a manual lever connected to said body member having a cam face formed thereon;

a cam follower engaged with said cam face of said manual lever at a first end thereof and engaged with said clutch means at a second end thereof;

means interposed between said cam follower and said clutch means for urging said clutch means so as to disengage from the intergaging member;

a taper bearing interposed between said axle shaft and said housing member;

a nut fixed to said axle shaft for pre-loading said taper bearing whereby a tightening force is applied to said taper bearing by said nut;

a brake drum connected to said body member;

thrust bearing means interposed between said brake drum and said axle shaft for rotatably supporting said brake drum; and

a second nut fixed to said axle shaft for maintaining said thrust bearing means and said interengaging member on said axle shaft.

4,291,792

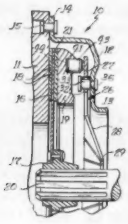
CLUTCH ASSEMBLY WITH MODULATED CUSHION FULCRUM

Alvaro Henao, Rochester, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 26, 1979, Ser. No. 106,598

Int. Cl.³ F16D *13/44*

U.S. Cl. 192—89 B **8 Claims**



1. In a vehicle clutch having a cover secured to a flywheel, a clutch disc, an axially reciprocable pressure plate and a diaphragm pivotally mounted in the cover, the pressure plate adapted to engage the clutch disc with the flywheel and having a fulcrum surface engageable by the diaphragm spring to engage the clutch, the improvement comprising at least three circumferentially equally spaced fulcrum members comprising plugs having reduced outer ends defining shoulders on the plugs, said pressure plate having holes drilled in the fulcrum surface to receive the fulcrum members, and cushioning means in each hole urging the members beyond the fulcrum surface to initially engage the diaphragm spring as the clutch is engaged, said cushioning means having an elastic force lower than the engaging force of said diaphragm spring, said fulcrum members having a limited extent of travel from a first position wherein the reduced outer ends of said members project beyond the fulcrum surface to a second position wherein the outer ends are in alignment with said fulcrum surface.

4,291,793

HAND BRAKE MECHANISM ADAPTED FOR USE ON A RAILWAY CAR

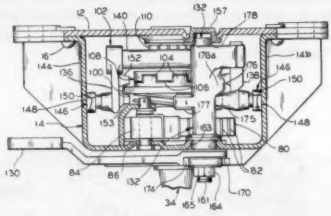
Wayne G. Klasing, New Lenox, Ill., assignor to Klasing Industries, Inc., Joliet, Ill.

Filed Oct. 15, 1979, Ser. No. 84,914

Int. Cl.³ F16D *13/60*; G05G *1/08*

U.S. Cl. 192—95 **8 Claims**

1. In a hand brake mechanism adapted for use on a railway car and including a handwheel operatively connected to rotatable shaft means, a pinion mounted on said shaft means for rotation relative thereto and for being operatively connected in a power train to the car brakes, a drive member connected to said shaft means for rotation therewith, a clutch collar mounted on said shaft means and having drive member-engagement means and pinion-engagement means, said collar being shiftable on said shaft means between a drive position wherein it drivingly interconnects said drive member and said pinion for application of the car brakes, and a brake-release position wherein the connection is broken and the pinion is freely rotatable on the shaft means, a shift lever mounted for pivotal movement and having collar-engaging members alternately engageable with opposite sides of said collar for shifting the collar between said positions, lug means on said shift lever and spaced apart from the pivotal axis of the lever, a cam shaft mounted for rotation in opposite directions about its axis, and a release cam on said shaft arranged to alternately forcibly engage with and disengage from said shift lever upon rotation of the cam shaft in opposite directions about its axis for shifting said collar to said brake-release position upon said engagement



and for enabling the collar to be shifted to said drive position upon said disengagement, the improvement which comprises:

a reaction member on said cam shaft and having a cam surface and a stop surface extending obliquely from the cam surface,

said cam surface forcibly engaging said lug means upon rotation of the cam shaft in a direction to disengage said release cam from said shift lever, thereby to shift said collar to said drive position,

and said stop surface being adapted to abut on said lug means when said collar is disposed in said drive position upon completion of the latter rotation of the cam shaft, thereby to positively and mechanically lock the collar in its drive position.

4,291,794

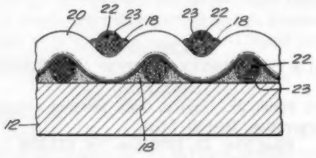
POWER TRANSMISSION AND ENERGY ABSORBING SYSTEMS

Dieter W. Bauer, La Habra Heights, Calif., assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 10, 1979, Ser. No. 83,290

Int. Cl.³ F16D *13/64, 13/72*; B29C *25/00*

U.S. Cl. 192—107 M **16 Claims**



1. A friction power absorption or power transmission assembly of the type having means for changing the relative position between a friction material and an opposing surface material from a position of complete engagement to a position of complete disengagement, said assembly comprising:

(a) a first member;

(b) a second opposing member;

(c) a carbon composite membrane affixed to one of said first and second members, said membrane comprising:

(1) a carbon fibrous substrate having an open porosity; and
(2) a coating of pyrolytic carbon extending substantially over each of said fibers of said substrate;
(d) means for introducing a liquid cooling medium between said first and second members.

4,291,795

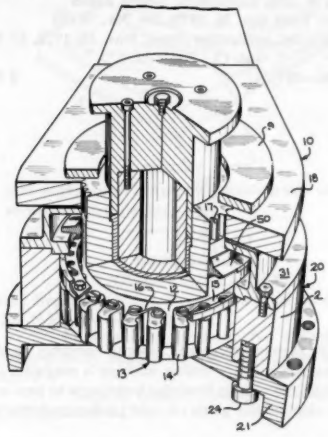
COUPLING LUBRICATION SYSTEM

Loris J. Charchian, 2540 Somerset Blvd., Troy, Mich. 48084; Donald O. Emmons, 24323 Pinecrest, Novi, Mich. 48050, and Thaddeus F. Zlotek, 23601 Hoover Rd., Warren, Mich. 48089

Filed Feb. 22, 1979, Ser. No. 13,959

Int. Cl.³ F16D *13/74*

U.S. Cl. 192—113 B **14 Claims**



1. A coupling comprising a first member adapted to be fixed against rotation, a rotatable member having an annular lubricant sump and unidirectional drive means adapted for engagement with said first member and said rotatable member, said first member having a ring extending into said sump, said ring having a radially outer surface and at least one lubrication passageway extending from said radially outer surface.

4,291,796

RETARDING CONVEYOR FOR CARGO

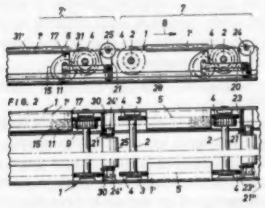
Elfriede Gebhardt, H. Thomastrasse 10, 6920 Sinsheim, Fed. Rep. of Germany

Filed Apr. 17, 1979, Ser. No. 30,923

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2953483

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—460 **1 Claim**



1. In a retarding conveyor for cargo, such as pallets, comprising a conveying means which can be driven in sections and carries the cargo, respective sections of said conveying means being driven by intermediate roller means driven by rotating drive means, the intermediate roller means being adjustable into a driving position or an idling position by feelers extending into the path of motion of the cargo, the improvement comprising respective sections of the conveying means comprising at least two parallel, uninterrupted traction means in the form of chains which are deflected at the ends of the section by reversing sprocket wheels joined together for rotation by a shaft which is rotatably supported in a conveyor frame, support means being provided on said conveyor for supporting said chains to carry the cargo, the drive means being in the form of a chain and at least one of the reversing sprocket wheels being driven by said intermediate roller means which comprises an additional sprocket wheel continuously engaging the chain of the drive means and a gear wheel connected to said additional sprocket wheel and engaging in the driving position a driving gear wheel connected for rotation with a reversing sprocket wheel, said gear wheel being out of mesh with the driving gear wheel in the idling position, wherein said conveyor frame includes a laterally inwardly open, U-shaped frame member provided between the reversing sprocket wheels of a section, wherein said support means is a profile of a synthetic resin which is arranged on the top web of this frame member for supporting the traction means, and wherein the respective feelers comprise a pivotably supported roller which is arranged between two neighboring sections of the conveying means, the roller of the respective feelers is rotatably mounted about a rigid axle that is arranged at levers pivotable about pins, which latter are fixedly attached to the frame of the conveyor, the rigid axle extensions projecting laterally through the levers for engaging said abutment means affixed to the frame when the roller is in its enforced idling position whereby said pivotably supported roller can support cargo in its enforced idling position.

4,291,797

PALLET CHANGER FOR A MANUFACTURE PLANT

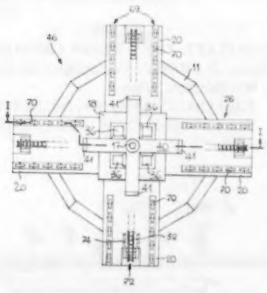
Norbert Ewertowski, Dietzenbach-Steinberg, Fed. Rep. of Germany, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Continuation of Ser. No. 867,968, Jan. 9, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 107,330

Claims priority, application Switzerland, Jan. 17, 1977, 511/77

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—472 **16 Claims**



1. A transfer apparatus, comprising:
support hub means having at least four non-rotating members;
rotating part means being rotatably mounted and extending radially outward from said support hub means;
said rotating part means comprising means for supporting pallets and having pallet guide means;
means for feeding pallets along said pallet supporting means;
address reading means mounted on each of said at least four

members, said address reading means being mounted adjacent to the ends of said pallet supporting means nearest the support hub means; and

marking means attached to said pallets for activating said address reading means once said pallets are on said pallet supporting means such that pallets are fed to predetermined locations.

4,291,798

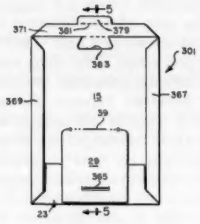
DISPLAY DEVICE

Felix Transport, 98 Riverside Dr., New York, N.Y. 10024

Filed Mar. 31, 1980, Ser. No. 135,539

Int. Cl.³ B65D *5/52*

U.S. Cl. 206—45.24 **15 Claims**



1. A display device having a collapsible easel support for supporting a display device on a surface at a predetermined angle comprising:

a back panel having a bottom edge;

a stay flap;

a support panel having top and bottom edges;

a stay panel including:

a glue panel having top and bottom edges;

a stay leaf having top and bottom edges;

a hinge connecting the bottom edge of said stay leaf to the top edge of said glue panel;

a first hinge hinging said stay flap to said bottom edge of said back panel;

a second hinge hinging the bottom edge of said support panel to the top edge of said stay leaf;

a third hinge hinging the top edge of said support panel to the interior of said back panel;

a fourth hinge hinging the bottom edge of said glue panel to said stay flap.

4,291,799

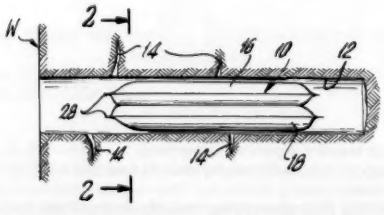
PARALLEL TUBE RESIN CAPSULES

Arnold B. Bower, Jr., Bristol, Va., assignor to General Electric Company, Worthington, Ohio

Filed Oct. 23, 1979, Ser. No. 87,471

Int. Cl.³ B65D *25/08, 30/22, 81/32*

U.S. Cl. 206—219 **7 Claims**



1. A resin bolting package comprising:

two elongated tubular containers formed from a frangible material, and disposed in side by side relation along the longitudinal axes of said elongated tubular containers and joined therebetween such that said package has a configuration which is generally a figure 8 shape in cross-section, with one of said tubular containers being filled with a polyester resin, and with the other said tubular container being filled with a hardener, such that said resin bolting package may be placed in a pre-drilled hole whereby when a bolt is thereafter inserted in said hole, said frangible tubular containers are ruptured with the contents therein mixing and forming a cured two-part plastic producing system for securing the bolt.

4,291,800

TAPE CASSETTE

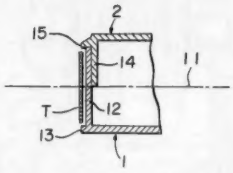
Masatoshi Okamura, and Haruo Shiba, both of Saku, Japan, assignors to TDK Electronics, Tokyo, Japan

Filed Sep. 26, 1979, Ser. No. 79,193

Claims priority, application Japan, Nov. 24, 1978, 53-160730

Int. Cl.³ B65D *85/672*

U.S. Cl. 206—387 **5 Claims**



1. A guide member of a tape cassette assembly having an upper casing and a lower casing wherein a magnetic tape is guided outside the casings from the front parts to pass in front of a hollow channel-like guide rib, said guide member comprising:

at least one guide rib vertically extending from the lower casing to the upper casing forming a supporting surface for the entire width of the magnetic tape; and

at least one guide rib vertically extending from the upper casing along the rear surface of the guide rib of the lower casing for supporting the guide rib of the lower casing such that the tape cassette is free from snagging the magnetic tape when the upper casing is assembled on the lower casing.

4,291,801

VIDEO CASSETTE STORAGE CONTAINER

Robert A. Basili, Waldwick, and William B. Wilson, Middlesex, both of N.J., assignors to Plastic Reel Corporation of America, Wood Ridge, N.J.

Filed Oct. 3, 1980, Ser. No. 193,792

Int. Cl.³ B65D *85/67*

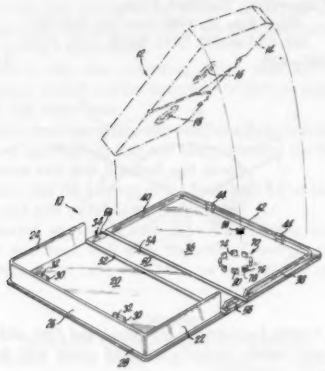
U.S. Cl. 206—387 **7 Claims**

1. A universal storage container capable of accommodating various sizes of video cassettes, each cassette including access holes, with the spacing between said access holes being non-uniform, said container comprising:

a generally rectangular housing having top, bottom, and side wall panels; and

a single circular array of elongated, flexible retaining sectors extending from said top or bottom panel, said sectors being uniformly spaced from a center point and defining an imaginary circle which is of slightly greater diameter than the diameter of an access hole in the video cassette, each said sector being disposed in spaced relationship within said housing so as to be generally aligned with an access hole in a video cassette, whereby when a video cassette is mounted within said housing, with said retaining sectors being received within a single access hole

therein, said flexible retaining sectors are biased radially inwardly to create an interference fit with the periphery of



said single access hole for maintaining said cassette fixedly secured within the housing.

4,291,802

LIGHT-TIGHT CASSETTE

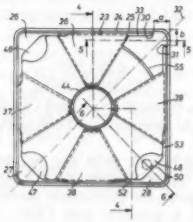
Edward Buelens, Kontich, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Mar. 13, 1980, Ser. No. 129,983

Claims priority, application United Kingdom, Mar. 15, 1979, 09182/79

Int. Cl.³ G03B *17/26*; B65H *19/02*

U.S. Cl. 206—409 **10 Claims**



1. A light-tight cassette for holding and dispensing a roll of light-sensitive material, said cassette being in the form of a rectanguloid casing comprising a four-sided shell with end closure walls having central hub portions for rotatably supporting said roll within the casing, the shell having a peripheral exit slot through which light-sensitive material can be drawn from said roll and at least one of said end walls being formed by a separate end cap which has spaced inner and outer peripheral wall portions defining a peripheral groove for receiving the end margins of the shell to hold the cap in place thereon and at corner sections thereof has axially projecting guide tongues which when the cap is in place fit inside corner regions of the corresponding end of the shell and constitute extensions of the inner face of the inner wall of such peripheral groove, characterised in that each of said guide tongues has a three-dimensional configuration defining an outwardly facing surface which is outwardly convexly curved both in radial planes passing through the axis of its hub portion and in transverse planes normal to said axis whereby said guide tongues provide a self-centering effect when the cap and shell are pushed together in abaxial and/or relatively angularly skewed relationship.

4,291,803

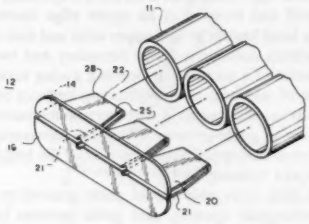
PROTECTIVE END CAP

Raul Perales, Exton, Pa., assignor to Windsor Communications Group, Inc., West Chester, Pa.

Filed Sep. 23, 1980, Ser. No. 190,087

Int. Cl.³ B65D *85/20*

U.S. Cl. 206—443 **9 Claims**



1. A package assembly including a plurality of transversely spaced longitudinally extending, parallel substantially coextensiveopen ended elongated tubular articles and an end member located at each end of and engaging said tubular articles and characterized in that at least one of said end members is formed of a unitary blank and comprises a plurality of transversal spaced longitudinally extending tongues projecting into respective articles and engaging the inside faces thereof and each including superimposed first and second panels integrally joined along a fold line at their outer edges and a pair of oppositely directed wing panels joined at their inner edges along fold lines to the inner edges of said first and second wing panels respectively, said wing panels engaging and substantially closing the corresponding ends of said articles.

4,291,804

STACKABLE TRANSPORT AND/OR STORAGE CONTAINER WITH ACCESS OPENING

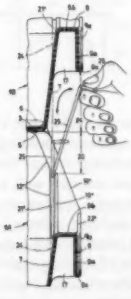
Karl A. Weidt, Siegen, Fed. Rep. of Germany, assignor to Fritz Schafer Gesellschaft Mit Beschrankter Haftung, Salchendorf bei Neunkirchen, Fed. Rep. of Germany and Fabriken fur Lager- und Betriebseinrichtungen, Neunkirchen, both of, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,485

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915812

Int. Cl.³ B65D *21/02, 25/04*

U.S. Cl. 206—509 **10 Claims**



1. A stackable container comprising:

a bottom wall, two parallel sidewalls and a rear wall of sheet material defining a substantially prismatic box of rectangular horizontal outline having a U-shaped top ledge

provided with an upstanding marginal ridge outwardly offset from the side rear edges of said bottom wall; and

a pair of hollow upright corner profiles integral with said sidewalls at a front end of said box, said corner profiles having confronting surfaces approaching each other more closely than said sidewalls and merging into a front wall substantially lower than said sidewalls and said rear wall, said front wall rising with a forward slope from said bottom wall and forming at an upper edge thereof a forwardly bend handgrip, said upper edge and said confronting surfaces defining a lower boundary and two lateral boundaries of a rectangular opening giving access to the interior of said box, said confronting surfaces being provided above said handgrip with vertical formations defining a pair of guide grooves which rise substantially from the level of said upper edge over part of the height of said rectangular opening; and

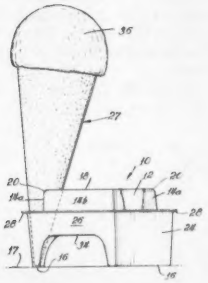
a closure plate receivable in said guide grooves to obstruct said rectangular opening, said guide grooves lying in a vertical plane located far enough forwardly of the foot of said front wall to facilitate the insertion of said closure plate from above even in the presence of an identical box seated on said top ledge and embraced by said marginal ridge.

4,291,805

ICE CREAM CONE TRAY

Leonard Seeley, Palatine, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Jul. 28, 1980, Ser. No. 173,143
Int. Cl.³ B65D *1/34, 85/78;* **A47G** *19/00;* **B65D** *1/36*
U.S. Cl. 206—563 **9 Claims**



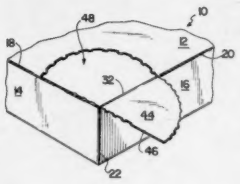
1. A unitary thermoformed plastic ice cream cone tray capable of securely and releasably holding at least three ice cream cones, said tray comprising at least three generally vertical but tray-inwardly inclined interior wall segments, a hemi-conical recess in each said interior wall segments, a generally vertical but tray-outwardly inclined sidewall opposite and in spaced relation to each said interior wall segment and means for joining the bottom edges of the respective opposed sidewalls and interior wall segments whereby each said recess and opposed sidewall together define a socket adapted to receive an ice cream cone, the inclinations of said sidewall forming each socket being such that the axis of said socket is inclined tray-inwardly and said tray further including a second set of interior wall segments each connecting adjoining first-mentioned interior wall segments to provide a continuous inner wall.

4,291,806

CARTON WITH VENTING ARRANGEMENT

John J. Austin, LeGrange, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 21, 1980, Ser. No. 113,758
Int. Cl.³ B43M *7/00;* **B65D** *3/26, 5/54*
U.S. Cl. 206—620 **11 Claims**



1. In a carton including a top panel and first and second adjacent side panels hingedly coupled along fold lines, the improvement comprising:

venting means formed in said panels for opening the carton to facilitate the escape of gas from the interior of the carton, comprising

a first perforated line extending along a portion of a fold line hingedly coupling two of said panels,

a second perforated line formed in one of said two panels and extending at one end from one end of said first perforated line,

a first fold line joining the other two ends of said first and second perforated lines, and

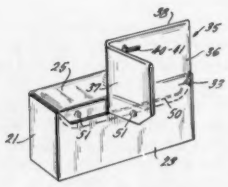
a vent flap defined in said one panel by said first and second perforated lines and said first fold line, which vent flap may be pivoted about said first fold line out of a plane containing said one panel after separation of said vent flap from the remainder of said one panel upon tearing of said first and second perforated lines.

4,291,807

FOLDING BOX

Vincent Giordano, Wantagh, N.Y., and Charles Senor, Fairview, N.J., assignors to International Folding Paper Box Co., Inc., Ridgefield, N.J.

Filed Nov. 7, 1979, Ser. No. 92,186
Int. Cl.³ B65D *5/18, 5/54*
U.S. Cl. 206—626 **6 Claims**



1. A folding carton having a front wall, a bottom wall, a back wall, a cover hingedly secured to said front wall;

said cover having a tuck-in flap extending from the end of the cover opposite the hinged securement of the cover to said front wall;

said tuck-in flap being adapted to lie in face to face relation with a portion of the interior of said back wall when said cover is closed; said portion of said interior of said back wall being opposite said hinged securement of said tuck-in flap and comprising that part of said back wall engaged by said tuck-in flap;

a panel extending from said back wall beyond said portion of said back wall engaged by said tuck-in flap;

a tear line in said back wall extending below said panel;

said tuck-in flap having a first section in surface to surface engagement with the portion of the back wall between the tear line and said panel;

said tuck-in flap also extending below said tear line and having a second section in surface to surface engagement with said back wall;

releasable securing means between said first mentioned section of said tuck-in flap and the portion of the back wall between said tear line and said panel;

said panel and the portion of the back wall between said tear line and said panel being removable;

said second section of said tuck-in flap being engageable with said back wall after removal of said panel and the portion of the back wall between the tear line and panel.

4,291,808

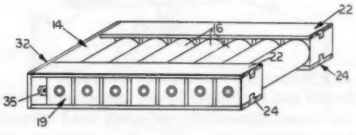
ROLLER CONVEYOR-CLASSIFIER

Carl A. Roloff, West Bend, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 79,264, Sep. 27, 1979, abandoned. This application Dec. 12, 1980, Ser. No. 215,853

Int. Cl.³ B07B *13/05*

U.S. Cl. 209—668 **1 Claim**



1. A roller conveyor or conveyor-classifier assembly comprising:

(a) a plurality of first subassemblies each comprising a roller (**16**), a bearing support block (**18**) for each end of each roller, a bearing (**21**) supported by each of said bearing support blocks (**18**), each roller (**16**), being rotatably supported contiguous its opposite ends by the bearings of its corresponding oppositely disposed bearing support blocks;

(b) a support frame (**25**) for said plurality of first assemblies, said support frame comprising an upper and lower rail member (**22A, 24A**) each defining a track (**22B, 24B**) projecting therefrom upwardly and downwardly, respectively, toward each other and in spaced relation from each other in a common plane perpendicular to the rail members (**22A, 24A**);

(c) each of said support blocks (**18**) being of upper case "H" configuration in transverse cross section to define an upper and lower groove (**18U, 18L**) having walls engaging with said upwardly and downwardly projecting tracks (**22B, 24B**) when said support blocks (**18**) are inserted between said upper and lower rail members (**22A, 24A**);

(d) shim means (**36**) between adjacent support blocks (**18**), said shim means being of substantially lower case "h" configuration in transverse cross section with the lower portion (**36A, 36B**) of said "h" configuration being adapted to interlockingly straddle the upwardly projecting track (**24B**) of the lower of said rails (**24A**) upon rotating a lower and forward leg portion (**36C**) of said "h" configuration inwardly of support frame parameter and over said lower track (**24B**) and into engagement with said lower rail (**24A**), whereby said shim means (**36**) may be inserted into and removed from shimming relation between contiguous bearing support blocks (**18**) when said roller conveyor assembly is in assembled condition.

4,291,809

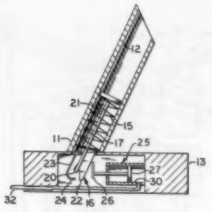
PENCIL HOLDER

Edwin J. Lyon, 787 Gascogne, St. Louis, Mo. 63141

Filed Jan. 11, 1980, Ser. No. 111,269

Int. Cl.³ A47F *7/00;* **B43M** *17/00;* **F41B** *7/08;* **F41C** *19/14*

U.S. Cl. 211—69.5 **10 Claims**



1. A pencil holder, comprising:

(a) a body having a socket,

(b) a pencil selectively received in the body socket,

(c) resiliently compressible means engaging the pencil within the body socket,

(d) locking means engaging the compressible means for selectively retaining the compressible means compressed upon insertion of the pencil in the body socket, and

(e) trigger means connected to and actuating the locking means for releasing the compressible means to launch the pencil from the body socket.

4,291,810

PACKAGE CLIP

Irving Rubenstein, P.O. Box #4012, North Hollywood, Calif. 91607

Filed Dec. 7, 1979, Ser. No. 101,087

Int. Cl.³ A47F *5/08*

U.S. Cl. 211—89 **6 Claims**

1. An article retaining assembly comprising:

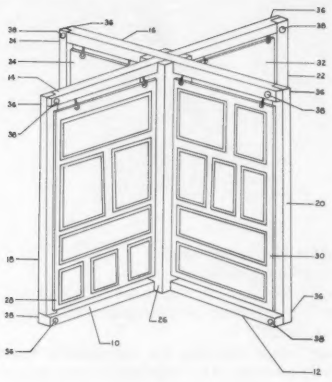
a hollow support member having a front opening and a mounting bracket located adjacent the front opening; and

a generally V-shaped clip having a front leg pivotally secured to the mounting bracket and a resilient back leg curved away from said front leg and passing through the opening, said back leg compressed against a surface at the rear of the support member, whereby the compressed back leg will cause the front leg to pivot and force the free end of the front leg against the front of the support member.

4,291,811
DISPLAY STAND

William A. Shaver, 3822 Palm Tree Blvd., Cape Coral, Fla. 33904

Filed May 7, 1979, Ser. No. 36,520
Int. Cl.[3] A47F *5/00*
U.S. Cl. 211—205 6 Claims



1. A display stand, comprising:

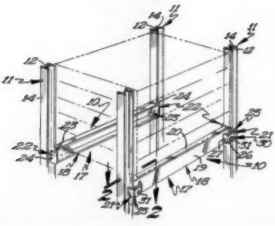
(a) an x-shaped base; (b) an x-shaped top; (c) a rectangular solid central vertical support member having cross-configured slots in each end, one end of which cooperates with the center of said x-shaped base and the other end of which cooperates with the center of said x-shaped top; and

(d) four display panels suspended from said x-shaped top.

4,291,812
PALLET STORAGE RACK ATTACHMENT

O. Burton Harmes, and Duane F. McGregor, both of Algona, Iowa, assignors to Algona Food Engineering Company, Algona, Iowa

Filed Sep. 24, 1979, Ser. No. 78,243
Int. Cl.[3] A47F *5/00*
U.S. Cl. 211—207 2 Claims



1. A support device for use in supporting pallets on vertical H-beams, each beam including a central web having flanges integral with each end thereof,

said support device including an elongate straight support member having a pair of openings therein, each opening being located adjacent but spaced from one end of said support member,

clamping means on each end of said support member to releasably engage the adjacent vertical H-beam, each of said clamping means including a J-shaped clamping member rigidly affixed to one end of said support member for encompassing and engaging an edge portion of the adjacent flange of the associated vertical H-beam,

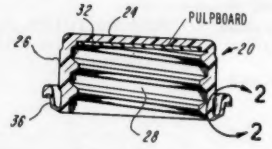
a pair of clamping elements each engaging the other edge portion of the flange of the adjacent vertical H-beam, each clamping element having an opening therein diposed in registering relation with an opening in the support member,

and nut and bolt assembly adjustably and releasably clamping a portion of each of said clamping elements against the flange of the adjacent H-beam and against said horizontal support member to releasably and adjustably support the end of the horizontal support member on the associated vertical H-beam.

4,291,813
CONTAINERS AND CLOSURES

David O. Allen, Wilmington, and Harry A. E. Wombold, Dayton, both of Ohio, assignors to Buckeye Molding Company, New Vienna, Ohio

Continuation-in-part of Ser. No. 878,416, Feb. 17, 1978, abandoned. This application Dec. 4, 1979, Ser. No. 100,099
Int. Cl.[3] B65D *41/34, 41/36, 41/38*
U.S. Cl. 215—252 23 Claims



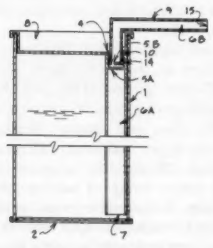
1. In a closure and container combination:

a closure and a container having cooperating screw threads; and a circumferentially extending band integrally joined by a relatively thin connecting portion to one of said closure and container for pivotal movement about said connecting portion, said band having a first position and, when pivoted from said first position, a second, reversed position so that when said closure and container are assembled, said band in said second position secures said one of said closure and container to the other of said closure and container.

4,291,814
CONTAINER WITH DRINKING TUBE

John L. Conn, P.O. Box 4501-Sta. B, Spartanburg, S.C. 29303

Filed Oct. 22, 1979, Ser. No. 87,320
Int. Cl.[3] A47G *19/22;* B67D *5/08*
U.S. Cl. 220—90.4 2 Claims



1. The construction of a container with drinking tube comprising:

a cylindrical shaped hollow container body for holding a fluid and having a bottom wall and a top wall, an interior tube extending vertically downwardly from said top wall into said body and having an opened bottom adjacent to and spaced from said bottom wall, said interior tube hav-

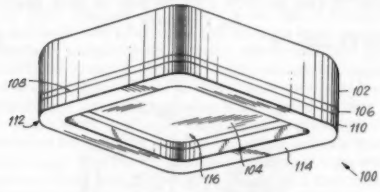
ing an opened top, said interior tube internally threaded adjacent said opened top and adapted to receive a corresponding externally threaded end of an exterior tube, a transverse wall in said interior tube below and adjacent from where said interior tube is threaded thereby separating said interior tube into an upper part and a lower part, porthole means through said transverse wall off center from the central, longitudinal axis of said interior tube providing the only fluid passage between said upper part and said lower part, said top wall having a rectangularly shaped groove extending across the central portion of said top wall, said opened top of said interior tube located within said groove, said groove adapted to receive a portion of the exterior tube.

4,291,815

CERAMIC LID ASSEMBLY FOR HERMETIC SEALING OF A SEMICONDUCTOR CHIP

Richard Gordon, Scarsdale, and John G. Ciallella, White Plains, both of N.Y., assignors to Consolidated Refining Co., Inc., Mamaroneck, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,527
Int. Cl.³ B65D *7/28, 6/40, 39/00*
U.S. Cl. 220—200 **10 Claims**



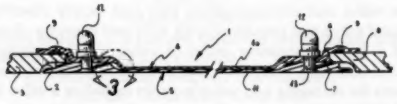
1. A lid assembly for hermetic sealing of a package containing a semiconductor chip comprising: a lid of dielectric material including an integral heat fusible metallic layer deposited on said lid in a peripheral region defining a hermetic sealing area.

4,291,816

FUEL TANK ACCESS DOOR FOR AIRCRAFT

Paul Lamoureux, Montreal, Canada, assignor to Canadair Limited, Montreal, Canada

Filed Jul. 9, 1980, Ser. No. 167,348
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—243 **10 Claims**



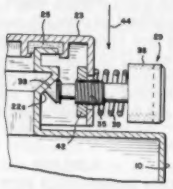
1. A fluid tight closure for an access aperture in a fuel tank or the like enclosure and comprising a non-conductive inner door panel, an outer door panel, and fasteners operatively securing said door panels in fluid tight closing position relative to the access aperture, said door panels being of bendable material and having each a rim portion operatively overlapping an edge portion of said access aperture, with said rim portions operatively clamping said edge portion upon engagement with an inner and an outer faces thereof respectively, and sealing means sealingly interposed peripherally of said edge portion intermediate the latter and at least one of said rim portions upon operative fastening of the inner and outer door panels in said fluid tight closing position.

4,291,817

WEATHERPROOF PANEL ENCLOSURE

Erlys C. Spitzer, and Frank Spitzer, both of 9782 S. Crestview Cir., Villa Park, Calif. 92667

Filed Jun. 9, 1980, Ser. No. 157,862
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—327 **7 Claims**



1. A weatherproof panel enclosure including:

(a) a box having an opening, the periphery of the opening being defined by an integral flange having an outward sloping portion;

(b) a cover having a peripheral lip dimensioned to overlap said integral flange when the cover is closed over the opening;

(c) a gasket in the under top portion of said cover adjacent to the inside of said lip extending about the perimeter of the cover dimensioned to engage the top of said integral flange when the cover is in closed position to thereby provide a sealing relationship;

(d) hinge means secured to a lip portion extending along one side of the cover and a corresponding one side of the box between the flange and the side of the box itself so that said cover can be swung away from the opening through an angle greater than 90°; and

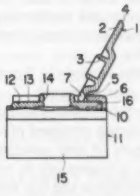
(e) securing means passing through a lip portion along the opposite side of the cover for engaging the sloping portion of the flange overlapped by the latter mentioned lip portion, the engaged portion of the flange sloping up and away from the opening towards the overlapping lip, said securing means being threadedly held in said lip portion so that inward threading of the securing means cams the cover down to compress said gasket against the top of the flange so that the cover can be tightly cammed into weathertight engagement with the box when in closed position.

4,291,818

LID STRUCTURES

Takamitsu Nozawa, and Takaharu Tazaki, both of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1980, Ser. No. 142,710
Claims priority, application Japan, May 18, 1979, 54/61116; May 23, 1979, 54/63495
Int. Cl.³ B65D *43/24*
U.S. Cl. 220—335 **8 Claims**



1. In a lid made of a synthetic resin comprising a lid base (**11**) having a cylindrical connector (**15**) threadedly connected, or fitted over the neck of a container body (**17**) in intimate contact therewith, and a lid body (**1**) disposed in the top wall (**12**) of

said lid base (**11**) and swingable like a cover for a book to open or close an opening (**14**) provided in said top wall (**12**), the improvement in which said lid body (**1**) comprises a lid plate (**2**) adapted for resting on said top wall (**12**), a generally flat rear end portion of said lid plate reduced in thickness to define a hinge (**5**), a hinge base (**6**) contiguous to said hinge, a connector (**10**) depending integrally from the underside of said hinge base (**6**), and a leg (**7**) of desired length extending rearwardly from the rear end of said lid plate (**2**), said leg being discontinuous in the area of said hinge (**5**), while said lid base (**11**) comprises said top wall (**12**) having an upper surface (**13**) which is flat at least in the rear half thereof facing said leg (**7**), and a connector (**16**) formed opposite to said connector (**10**) for firmly engaging and holding said connector (**10**).

4,291,819

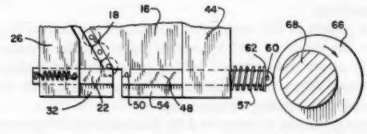
HIGH SPEED DISPENSER FOR ELECTRICAL COMPONENTS

Martin G. Heller, 68 Harvey Dr., Short Hills, N.J. 07078; Joel Rudder, Rockaway, and Stanley J. Arasim, Jr., West Milford, both of N.J., assignors to Martin G. Heller, Short Hills, N.J.

Filed Apr. 7, 1980, Ser. No. 138,177

Int. Cl.[3] **B65G** *59/06*

U.S. Cl. 221—298 **10 Claims**



1. A high speed dispenser adapted for loose electrical components characterized in that each component has like-sized tubular bodies in both diameter and length and from the ends of each body extend wire-like conductors which are substantially central of each body, said dispenser including:

(a) a chute having opposed wall portions with parallel inner faces defining a spaced apart guide for the bodies of said electrical components;

(b) a track path provided in each wall portion of the chute, said track disposed to receive and freely guide and confine a wire end of a component as the tracks receive and deliver the loose components by gravity to a lower end of the chute;

(c) a pair of rear support and bearing blocks including means to support the chute in a desired orientation;

(d) a pair of reciprocative rear plungers slidably carried in said blocks;

(e) biasing means for moving each plunger forwardly to a determined at-rest position and with the upper surface of each plunger in way of the discharge end on the track so as to receive and engage in a supporting manner the wire ends of the lowermost component;

(f) spacer means for positioning the rear bearing blocks, the chute and rear plungers at a determined apart distance;

(g) a pair of front support and bearing blocks including means for securing and supporting said chute;

(h) a pair of reciprocative front plungers slidably carried in said front blocks;

(i) biasing means for urging the front plungers in a direction away from the rear plungers;

(j) a notch of determined width and depth formed in one end of each of the facing opposed plunger pairs so as to provide a spaced pair of said notches substantially in alignment when the plungers are in an oriented position disposed at and just below the top surface of said plungers to provide a receiving notch for each of said wire ends on the lowermost electrical component;

(k) cam means and motive means adapted to engage and move the forward plungers in a rapidly reciprocated motion, said cam means providing a rearward displacement of the front plungers to bring the notches in way of the wire ends of the lowermost component to allow the wire ends of said component to drop into said notches as and when the rear plungers are moved rearwardly by and with the displacing movement of the front plungers, said rear plungers are moved from a wire end supporting condition, and

(l) forward and downward guide means disposed so as to engage the wire ends of the lowermost component as it is carried in said notch, said guide means disposed to insure that the wire ends of the lowermost component drop from the dispenser through the space between the rear and front plungers when and while the front plungers are in and at their forwardmost position.

4,291,820

LIQUID METERING DISPENSER

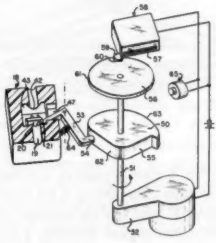
Jack D. Marrington, Capalaba, Australia, assignor to J. D. Engineering Services Pty. Ltd., Australia

Continuation-in-part of Ser. No. 685,922, May 12, 1976, Pat. No. 4,153,187. This application Jan. 16, 1979, Ser. No. 3,894

Claims priority, application Australia, May 16, 1975, 1636/75; Oct. 30, 1975, 3780/75; Feb. 13, 1976, 4847/76

Int. Cl.[3] **G01F** *11/42*

U.S. Cl. 222—70 **5 Claims**

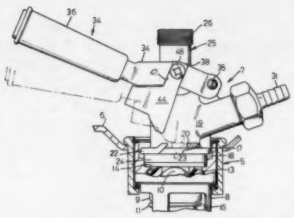


1. A liquid dispenser comprising a metering chamber and a piston assembly selectively movable therein to vary the volume of said chamber, said piston assembly including a hollow piston rod providing a flow through passage communicating with said metering chamber, a supply chamber adapted for liquid communication with said metering chamber via said hollow piston rod, the upper regions of said supply and metering chambers being in air communication, a hollow valve body intermediate said supply and metering chambers including a first valve seat communicating with said supply chamber, a second valve seat communicating with said metering chamber and a liquid dispensing outlet; a valve member positioned within said valve body and actuable exteriorly thereof; control means for actuating said valve member including a valve lever and timing means operatively connected to said valve lever for controlling the operating cycle of said valve member, whereby during one operating cycle said valve member is actuated initially by said valve lever into a first position so as to close said first valve seat and permit communication between said second valve seat and said dispensing outlet and is maintained in said first position for a period of time sufficient to permit the emptying of said metering chamber through said dispensing outlet, said valve lever thereupon actuating said valve member into a second position so as to close said dispensing outlet and permit communication between said supply and metering chambers via said first and second valve seats and is maintained in said second position for a period of time sufficient to refill said metering chamber from said supply chamber.

4,291,821
KEG TAPPING SYSTEM UNIT AND VALVE INTERLOCK

James E. Nezworski, Milwaukee, Wis., assignor to The Perlick Company, Inc., Milwaukee, Wis.

Filed Oct. 4, 1979, Ser. No. 81,670
Int. Cl.[3] F16K *35/00*; F16L *37/24*
U.S. Cl. 222—153 4 Claims



1. A tavern unit for a keg tapping system, to which a pressure gas duct and a beverage duct are normally connected and which is detachably connectable to a keg unit that is installed in a keg and has an upwardly opening well into which opposite lugs project radially, said tavern unit having a body with a base portion which is rotatably receivable in said well and which cooperates with said lugs to provide a bayonet connection between said units, said tavern unit also having a lever projecting substantially radially from its body, above said base portion, whereby the tavern unit can be bodily rotated for engagement and disengagement of said bayonet connection, said lever also comprising a valve actuator that is swingable relative to the body downward to a valve open position providing for communication between the interior of said keg and said ducts and upward to a valve closed position that permits separation of the units without loss of gas or beverage, said tavern unit being characterized by: abutment means rigidly fixed to said lever for up and down motion therewith and projecting downwardly from said lever, towards said base portion, said abutment means being arranged for cooperation with one of said lugs on a keg unit and having

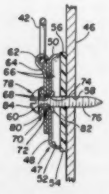
(1) a downwardly facing abutment at its bottom which is engageable with a top surface on one of said lugs when said bayonet connection is not fully engaged, to prevent the lever from swinging down to its valve open position, and

(2) a circumferentially facing abutment which is engageable with an opposing circumferentially facing surface on one of said lugs when said lever is in its lowered valve open position and which thus cooperates with said lug to then prevent rotation of the tavern unit to a position in which said bayonet connection is disengaged.

4,291,822
GUITAR STRAP

Lawrence Simonds, c/o Simtron Industries Incorporated, 139 E. Merrick Rd., Freeport, N.Y. 11520

Filed Jun. 2, 1980, Ser. No. 155,605
Int. Cl.[3] G10D *3/00*; G10G *5/00*
U.S. Cl. 224—257 3 Claims

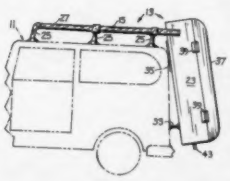


1. A guitar strap loop attached in swiveling relation to a guitar body comprising an attachment member having a central operative surface maintained at a clearance position from said guitar body by a peripheral lip extending transversely from said central operative surface into contact with said guitar body, a cylindrically shaped threaded screw with an enlarged diameter head disposed through said operative surface into threaded engagement with said guitar body, a guitar strap loop disposed on said screw having an operative interposed position between said head of said screw and said attachment member central surface, a hollow rivet disposed in encircling relation about said screw having an outwardly flared pair of ends adjacent said screw head and in said clearance beneath said attachment member central surface for maintaining said guitar strap loop in disposed relation on said screw while permitting said guitar strap loop to swivel about said hollow rivet, and a plastic disk disposed on said screw positioned adjacent said guitar body and sized to extend beneath said attachment member peripheral lip, whereby threaded adjustment of said screw contributes to the firmness of the attachment of said guitar strap loop to said guitar body without adverse effect on the swiveling movement thereof.

4,291,823
TRACK-MOUNTED PULL-DOWN LUGGAGE-CARRIER FOR AUTOMOBILES

James D. Freeman, 19 Hedge Dr., Springfield, Ill. 62702, and Robert L. Freeman, 262 Stutely, Springfield, Ill. 62704

Filed Nov. 16, 1979, Ser. No. 94,971
Int. Cl.[3] B60R *9/00*
U.S. Cl. 224—310 11 Claims



1. A top-mounted pull-down luggage carrier for automotive vehicles, comprising: a pair of tracks adapted for parallel longitudinally disposed attachment to the top surface of a vehicle, a carrier body having a pair of low-friction means fixed thereto adjacent the front portion thereof and guidedly engaged with said tracks, cam-like means interacting between the under surface of said carrier body and adjacent top rear surfaces of said vehicle to protect said adjacent top rear vehicle surfaces as said carrier rests thereupon and/or is moved rearwardly and downwardly thereover while being continuously attached to and partially supported by said tracks, said cam-like means having a upwardly convex surface which is shaped first to lift said carrier body slightly as it moves upwardly and forwardly over said cam-like means and secondly to drop forwardly beyond a vertically disposed abutment for arresting rearward movement of said carrier body unless slightly lifted to clear said abutment.

4,291,824

SELF-ALIGNING METHOD FOR SCORING FRACTURABLE MATERIAL

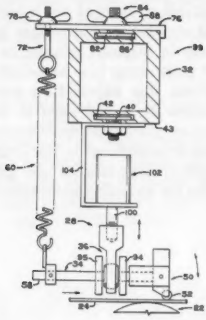
Robert P. DeTorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 872,417, Jan. 26, 1978, abandment, which is a division of Ser. No. 725,222, Sep. 22, 1976, Pat. No. 4,096,773.

This application Nov. 13, 1979, Ser. No. 93,778

Int. Cl.³ C03B *33/02*

U.S. Cl. 225—2 **4 Claims**



1. A method of scoring a sheet of fracturable material, comprising the steps of:

providing an elongated member having scoring means;

universally pivoting the elongated member;

displacing the sheet and scoring means relative to one another; while

biasing the scoring means against the sheet to score the sheet and maintain the scoring means in an upright position.

4,291,825

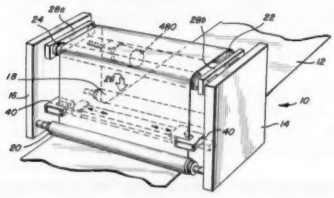
WEB GUIDING SYSTEM

Richard Glanz, Crystal Lake, Ill., assignor to Baldwin-Korthe Web Controls, Inc., Addison, Ill.

Filed Apr. 19, 1979, Ser. No. 31,393

Int. Cl.³ B65H *25/26;* **G01N** *21/86;* **G01V** *9/04*

U.S. Cl. 226—18 **45 Claims**



30. A web control assembly for a web comprising an entrance roller,

a tilt frame having a pair of tilt rollers mounted thereon,

an exit roller,

said web being disposed under the entrance roller, over the tilt rollers and under the exit roller,

a motor means connected to the tilt frame operable to move the frame to cant the tilt rollers with respect to the longitudinal line of travel of the web,

a web edge scanner adjacent at least one edge of the web, said scanner including

a source of radiation in the infrared range,

focus means for guiding said radiation into a channel having a width encompassing the range of normal web edge deviation from a desired path along said longitudinal line of travel, and

signal means spaced from said focus means for receiving said radiation and producing a continuous output signal corresponding to the magnitude of said radiation passing the edge of the web, and

means intermediate the motor means and the scanner for directing the motor means to cant and straighten the tilt frame.

4,291,826

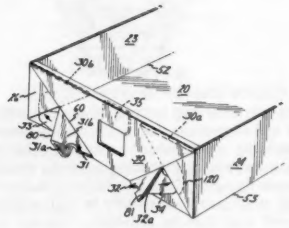
STORAGE CONTAINER

John L. Swanson, 2100 Sargent Ave., St. Paul, Minn. 55105

Filed Jul. 20, 1979, Ser. No. 59,482

Int. Cl.³ B65D *5/26*

U.S. Cl. 229—31 FS **8 Claims**



1. A container folded from a single blank of corrugated fiberboard comprising:

(a) a bottom;

(b) a side;

(c) an end;

(d) a webbed corner continuous with said bottom, side and end and folded diagonally to overlie said end when said bottom, side and end are mutually orthogonal;

(e) a flap continuous with said end and folded outward and downward to overlie a portion of said corner when folded; and

(f) a lock tab continuous with said flap and including a tongue for insertion between said end and a portion of said folded corner not underlying said flap, said lock tab comprising a perforation score extending in the direction of the length of said container, and a pair of converging crease scores mutually intersecting with said perforation score, said perforation and crease scores being constructed and arranged to permit folding of said lock tab in opposite directions to enable said tongue to lie flat against said end during sliding and insertion beneath said portion of said folded end.

4,291,827

CARTON WITH SELF-LOCKING END CLOSURE AND BLANK FOR FORMING SAME

Terence J. Mulroy, Sioux City, Iowa, assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 3, 1980, Ser. No. 126,376

Int. Cl.³ B65D *5/10*

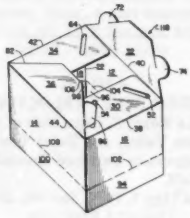
U.S. Cl. 229—39 R **11 Claims**

1. A carton with a self-locking end closure, comprising:

four wall panels coupled at adjacent side edges thereof; and

self-locking end closure means comprising first, second, third and fourth end closure flaps each hingedly coupled to one of said wall panels at adjacent end edges thereof along fold lines, said end closure flaps having outer edges opposite said fold lines, each flap of one pair of opposed flaps having two elongated slots therein oriented at acute angles relative to the fold line between the respective panel and flap, each flap of the other pair of opposed flaps having angular side edges oriented at acute angles relative

to the fold line between the respective panel and flap and a pair of tabs extending from said angular side edges, said



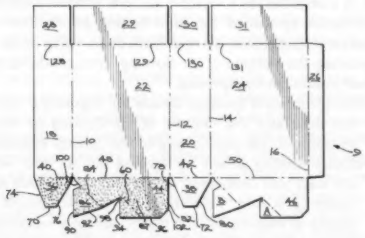
tabs being spaced inwardly from the outer edges of said other pair of opposed flaps.

4,291,828

COMBINATION COLLAPSABLE SELF-ERECTING SELF-LOCKING CARTON

Paul R. Nigro, Norridge, Ill., assignor to Royal Continental Box Company, Cicero, Ill.

Filed Apr. 14, 1980, Ser. No. 139,835
Int. Cl.³ B65D *5/36*
U.S. Cl. 229—41 B **20 Claims**



1. A folding carton formed from a blank of cardboard, comprising:

(a) four sidewalls hingedly connected by their edges to form a generally rectangular tubular enclosure;

(b) bottom wall means formed by two similarly-shaped bottom sections, each section being formed from two elements fixedly joined together and hingedly connected to the lower edges of two adjacent sidewalls, each of said sections being scored along a line permitting folding thereof to correspond with the folding of the associated sidewalls, pressure on opposite corners of the folded carton forcing the sidewalls to open outwardly with the bottom sections gradually assuming a position generally transverse to said sidewalls; and

(c) scored flap means joined to said bottom sections for interengaging and latching together said bottom sections, said scored flap means deploying with said bottom sections to overleaf and hold said bottom sections in said substantially transverse position, said scored flap means bending inwardly towards the interior of said carton while said bottom sections deploy outwardly from the interior of said carton thereby freeing said bottom sections to overleaf one another, deployment of said bottom sections freeing scored flap means to return to a position generally transverse to said sidewalls whereby said bottom sections are locked in place to form a substantially rigid, collapse-resistant structure,

said bottom wall means remaining locked in a deployed position until said scored flap means are folded inwardly towards said sidewalls thereby freeing said bottom wall means to be collapsed

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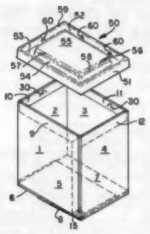
4,291,829

ICE CREAM CONTAINER, BLANK THEREFOR, PARTIALLY ERECTED TUBE, AND PACKAGE COMPRISING SAME, SAID CONTAINER PLUS PLASTIC COVER AND PLASTIC COVER ITSELF

Thomas VanderLugt, Jr., Kalamazoo, Mich., assignor to Brown Company, Kalamazoo, Mich.

Filed Aug. 30, 1979, Ser. No. 71,242
Int. Cl.³ B65D *43/04, 43/10, 3/12*
U.S. Cl. 229—43 **33 Claims**



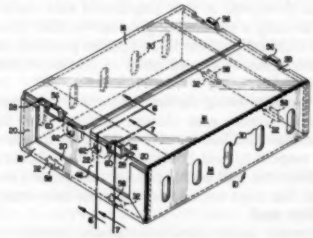
1. An integral blank cut and scored to provide a tubular container comprising substantially rectangular rear, side, and front wall members, a glue flap articulated along a score to one of said container wall members and adapted to be adhered to an adjacent container wall member, bottom-forming flaps articulated to each of said wall members along scores at one end of said blank, and edge-reinforcing flaps articulated to each of said container rear, side, and front wall members at the other end of said blank having areas of low resistance comprising cuts or cut-out areas defined therein and being adapted to be folded over and adhesively secured to the inside of said adjacent wall members to which said edge reinforcing flaps are articulated, thereby to form a folded-over, reinforced portion of double thickness at that end of said blank and in a tubular container erected from said blank, with said areas of low resistance comprising cuts or cut-out areas being present in the inner exposed surface of folded-over edge-reinforced portions of the walls of said container erected from said blank.

4,291,830

CONTAINER WITH LOCKING LID

James R. Sorensen, San Mateo County, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Dec. 26, 1979, Ser. No. 106,741
Int. Cl.³ B65D *5/32*
U.S. Cl. 229—45 R **7 Claims**



1. In a container having a body and a lid, said body defined at least in part by a wall, the improvement comprising:

a locking slot extending into said wall from an edge of said wall, said wall having inner and outer wall portions confining said slot;

a locking flap carried by said lid and having a locking relief therein, said flap extendable into said slot when said lid is closed to position said locking relief between said inner and outer wall portions; and

a locking tab carried by said outer wall portion and extendable into said slot to engage said locking relief when said lid is closed to lock said lid to said body.

4,291,831

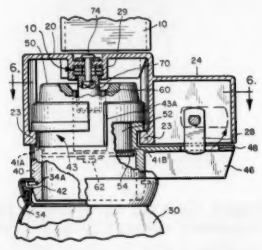
SECURITY HOUSING

Ronald A. Domkowski, Arlington Heights, Ill., assignor to Honor Gard, Inc., Chicago, Ill.

Filed Jun. 29, 1979, Ser. No. 53,638

Int. Cl.³ G07B *15/00*

U.S. Cl. 232—15 **5 Claims**



1. In a security system for releasably mounting a coin-collecting container in a coin processing machine, the improvement comprising:

a mounting member removably attached to said container including a coin-receiving aperture for directing the coins into said containe:

rotatable closure means movable on said member between an opened position, allowing the coins to pass through said aperture, and a closed position blocking the passage of coins through said aperture;

locking means on said member for selectively locking said closure means in said opened or closed positions and for driving said closure means therebetween;

a housing adapted for connection to said coin processing machine and further adapted to releasably connect said mounting member and the associated container to said machine, said housing including means for receiving coins processed by said machine and directing the coins into said container through the aperture in said mounting member;

key means provided on said housing and engagable with said locking means on said member, as said member is inserted in and rotated with respect to said housing, to drive said closure means of said member between said opened and closed positions, so that rotation of said member within said housing a selected degree moves said closure means from a closed position to an opened position and thereby permits coins to be deposited in said container through said member;

said key means being further engagable with said locking means to rotate said closure member into said closed position as said member is rotated in a counter-direction with respect to said housing, so that the removal of said member from said housing closes said closure member and retains the coins within said container associated with said member; and

high-strength insert means integrally joined within said housing member and firmly connecting said key means in a non-rotatable position is said housing, said insert means including outer detents on its periphery for engagement with said housing, to prevent rotation of said insert, and further including inner detent means projecting inwardly and engaged with said key means to positively prevent relative rotation of said key means with respect to said housing.

4,291,832

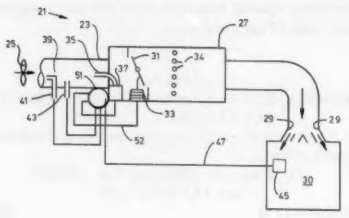
SYSTEM POWERED RESET VELOCITY CONTROLLER

Le Roy D. Ginn; Le Royce S. Ginn, both of San Leandro; John C. Morris, Castro Valley, and Dalny Travaglio, Kensington, all of Calif., assignors to Universal Pneumatic Controls, Inc., San Leandro, Calif.

Filed May 7, 1979, Ser. No. 36,823

Int. Cl.³ F24F *7/06*

U.S. Cl. 236—49 **8 Claims**



1. A controller for a variable air flow volume conditioned air distribution system of the kind having an air flow duct for supplying conditioned air to a room and a valve in the duct for regulating the volume of air flowing through the duct,

said controller comprising,

movable control element means for regulating the valve in the duct and the volume of air flowing in the duct in response to the positioning of the control element means,

velocity sensing means for sensing the air flow velocity in the duct and connected to the control element means for applying a flow velocity force to the control element means in response to the sensed air flow velocity,

velocity spring means connected to the control element means for applying a spring force to the control element means in opposition to the flow velocity force of the air flow velocity sensing means to determine the air flow velocity set point of the controller,

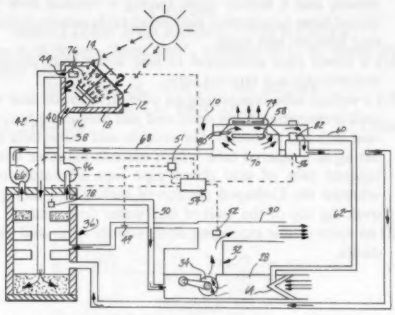
room temperature sensing means for sensing the room temperature and for producing a temperature force in response to the sensed temperature and operatively associated with the velocity spring means, and

bias adjustment means operatively associated with the velocity spring means for varying the rate of the velocity spring from a low spring rate for control at a low maximum permitted flow velocity in the duct to a higher spring rate for control at a higher maximum permitted flow velocity in the duct and vice versa and wherein the spring is a leaf spring and the bias adjustment means include a movable end support for one end of the leaf spring for increasing and for decreasing the effective length and the rate of the spring with changes in the location of the end support and including a first point of engagement between the room temperature sensing means and the velocity spring and a second point of engagement between the movable control element means and the velocity spring means and wherein the first and second points of engagement are so located with respect to the end support as to produce an increasing mechanical advantage through the leverage provided by the spring for the temperature force over the flow velocity force as the effective length of the spring is decreased.

4,291,833
HEATING SYSTEM WITH FOCUSED SOLAR PANELS AND HEAT PUMP ASSIST

Anthonino A. Franchina, Sterling Heights, Mich., assignor to Karl Wojcik, Warren, Mich., a part interest

Filed Oct. 15, 1979, Ser. No. 84,880
Int. Cl.[3] G05D 23/00
U.S. Cl. 237—2 B 6 Claims



1. A stationary solar heater for utilizing sunlight to heat a solar energy collector of the type wherein a fluid is circulated past the collector to absorb heat therefrom and translated to a device for utilizing the heat contained within the fluid, the improvement comprising:

a plurality of lenses interposed between the collector and the sun; said lenses concentrating the solar energy on the collector;

the collector having a length substantially longer than the length of the plurality of lenses, and wherein the plurality of lenses and the collector are aligned so that in the morning the entire amount of solar energy striking the lenses is concentrated directly on a first portion of said collector, at noon the entire amount of solar energy striking the lenses is concentrated directly on a second or central portion of the collector, and in the afternoon the entire amount of solar energy striking the lenses is concentrated directly on a third portion of the collector; said solar heater further comprising a heating system device for a building comprising:

a conditioned air duct for passing conditioned air;

an air return for passing return air;

an air circulator having an inlet communicating with said air return, an outlet communicating with said conditioned air duct, and a first fan for moving air from said inlet to said outlet wherein the air pressure in said outlet is above the air pressure in said inlet;

means for utilizing heat from the solar collector to warm air passing through said air circulator;

a heat pump comprising a condenser disposed within said air return, said condenser heating air passing thereby from said air return, said heat pump having an evaporator located externally of said building for drawing heat from air passing thereby;

a first temperature sensor in the conditioned air duct for turning on the heat pump at a preset temperature;

a fan for passing air by said evaporator;

a conduit communicating the means for utilizing heat from the solar collector with a first chamber surrounding the evaporator so that solar warmed air may be drawn from the means for utilizing heat to increase the ambient temperature of the air surrounding the evaporator, a conduit communicating the first chamber with the means for utilizing heat to return air from the first chamber to the means for utilizing heat when said air has given up its heat;

a fan means within the conduit for translating solar warmed air to the first chamber and from the first chamber to the means for utilizing heat;

said means for utilizing heat from the solar collector to warm air passing through said air circulator comprising:

a heat storage chamber;

a first conduit interconnecting the storage chamber and a solar collector inlet;

a second conduit interconnecting a solar collector outlet and the heat storage chamber;

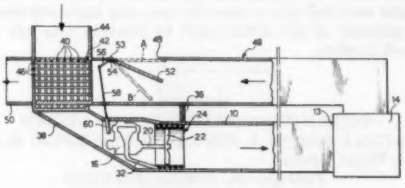
a second fan in the first conduit for translating air from the heat storage chamber to the solar collector and from the solar collector through the second conduit to the heat storage chamber translating solar warmed air to the heat storage chamber;

a third conduit interconnecting the heat storage chamber and the conditioned air duct, a fourth conduit interconnecting the heat storage chamber and the air return duct wherein air flows from the solar collector outlet to the heat storage and from the heat storage chamber to the inlet warming air passing through the air circulator.

4,291,834
SYSTEM FOR HEATING AIR

Mario Palazzetti, Avigliana; Giorgio Becchi, Turin, and Guiseppe Cane, Sangano all of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Oct. 3, 1979, Ser. No. 81,585
Claims priority, application Italy, Oct. 5, 1978, 69306 A/78
Int. Cl.[3] F24D 5/00
U.S. Cl. 237—12.1 6 Claims



1. In a system for heating air, comprising:

an air conveyor duct, having an inlet mouth open to the atmosphere at one end thereof and an outlet at the other end thereof;

means for heating air within said duct; and

means for causing axial flow of air through said duct whereby to draw external air in to said duct through said inlet mouth and convey said air through said duct to said outlet of the said duct;

the improvement wherein said means for heating air within said duct comprise an air-cooled internal combustion engine mounted within said duct and connected to said means for causing axial flow of air within said duct whereby to drive said air flow causing means,

said means for heating air within said duct further comprise heat exchanger means through which the exhaust gases produced by said internal combustion engine pass as heating fluid for the air to be heated, said heat exchanger being housed within said duct, downstream of said internal combustion engine with respect to the direction of flow of said air to be heated,

a utilizer having an inlet connected to the outlet and said air conveyor duct and an outlet,

a return duct connected to the outlet of the utilizer to receive used air therefrom;

means for conveying said exhaust gases from said internal combustion engine into said return air duct after said exhaust gases have passed through said heat exchanger whereby to mix said exhaust gases with the used air coming from said utilizer,

a second heat exchanger for pre-heating the air drawn into

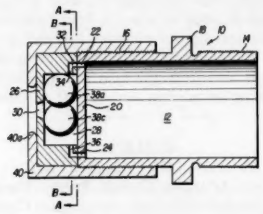
said air conveyor duct, said second heat exchanger being located upstream of said internal combustion engine, and means for directing said used air and exhaust gases as heating fluid through said second heat exchanger.

4,291,835

MIST PRODUCING NOZZLE

Samuel Kaufman, 6210 Park Heights Ave., Baltimore, Md. 21215

Filed Dec. 7, 1979, Ser. No. 101,264
Int. Cl.³ B05B *1/34*
U.S. Cl. 239—11 **16 Claims**



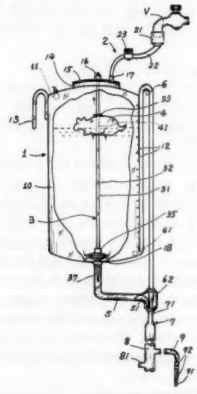
1. In a nozzle for atomizing a liquid, the nozzle having a single orifice outlet and a liquid inlet, the improvement comprising a plurality of balls rotatably retained in a chamber upstream of said orifice outlet so as to be in constant rolling contact with each other in a path of travel around said orifice outlet such that they contact the incoming liquid and atomize it upstream of said orifice outlet by breaking it up into very small droplets.

4,291,836

INTERMITTENT WATER-SUPPLY SYSTEM

Wu Chen-Hsiung, No. 3, Alley 5, La. 10, Tung-Ho East St., Sec. 2, Taipei, Taiwan

Filed Oct. 23, 1979, Ser. No. 87,346
Int. Cl.³ F04F *10/00*
U.S. Cl. 239—37 **10 Claims**



1. Apparatus for intermittently supplying a predetermined quantity of water at regular, predetermined intervals comprising:

(a) a water tank for accumulating and storing water including an air vent in the top of said tank and an outlet in the bottom of said tank, said outlet comprising outlet valve means slidably mounted on a guide rod such that said outlet may be alternatively opened and sealed;

(b) water feeding means and inlet valve means for filling said water tank at a constant, predetermined rate of flow;

(c) float-actuated valve means within said water tank comprising a stem slidably mounted in a substantially vertical position within said water tank and drilled with a plurality of pin holes at varying heights so as to accommodate a readily-removable insert pin, said stem being threadably formed on its lower end so as to engage said outlet valve means, and a hollow float having a vertical hole partitioned from said hollow portion slidably mounted through said hole on said stem;

(d) a down pipe connected to said water tank outlet and terminating in a tapered tube;

(e) a siphon tube comprising an inlet stem inside said water tank terminating in an open end just above the bottom of said tank and an outlet stem outside said water tank terminating in a tapered tube which extends together with the tapered tube of said down pipe into a venturi outlet, wherein the U-shaped portion of said siphon tube passes over the top of the wall of said water tank; and,

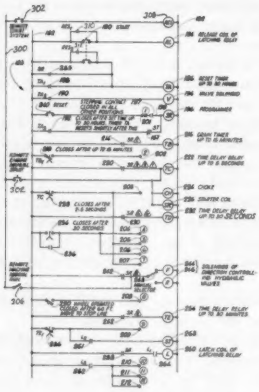
(f) an ejector tube extending downwardly from said venturi outlet.

4,291,837

AUTOMATIC MULTIPLE MOVE IRRIGATION LINE

Lyndle G. Gheen, 1173 Clinton Dr., Eugene, Oreg. 97401

Continuation of Ser. No. 941,194, Sep. 11, 1978, which is a continuation of Ser. No. 757,033, Jan. 5, 1977, abandoned. This application Nov. 13, 1979, Ser. No. 92,950
Int. Cl.³ A01G *27/00*
U.S. Cl. 239—70 **11 Claims**



1. In an automatic multiple move irrigation line,
an irrigation pipe,
wheel means supporting the pipe,
a prime mover,
motor means drivable by the prime mover for driving the wheel means,
starting means for starting the prime mover,
solenoid means for actuating the starting means,
means for supplying water under pressure to the pipe, timing circuit means for periodically actuating the solenoid means.
water control means responsive to the timing circuit means for shutting off the water supplying means before each actuation of the starting means, drain means resonsive to said circuit means for draining the pipe before each actuation of said starting means,
means for stopping the prime mover at the end of each predetermined move of the line,
the water control means being responsive to the timing circuit means for actuating the water supplying means to

the line only after the prime mover is stopped each time to sprinkle,

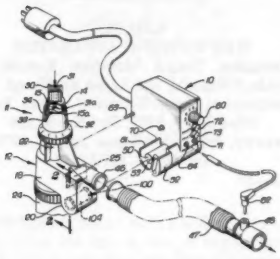
and means responsive to a predetermined number of cycles of moves and sprinklings for actuating the water control means and prevent further actuation of the solenoid means.

4,291,838

NEBULIZER AND ASSOCIATED HEATER

Andrew S. Williams, Brea, Calif., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Dec. 26, 1979, Ser. No. 107,062
Int. Cl.³ B05B *1/24*
U.S. Cl. 239—138 **13 Claims**



1. A nebulizer system for producing a heated aerosol spray for delivery to a patient comprising:

an integral nebulizer having a nebulizer chamber, aerosol means for producing a liquid aerosol spray in the nebulizer chamber, means for supplying liquid to the aerosol means, a heating chamber located downstream of the nebulization chamber and in flow communication therewith, said heating chamber including an integral liquid collection well for collecting precepitation from the aerosol, a heat exchange sleeve extending into said collection well, the interior of the sleeve being isolated from the heating chamber, and an outlet port connected to the heating chamber for directing the aerosol out of the heating chamber; and

a heater detachably connected to the nebulizer, said heating including a heating element extending into and contacting the sleeve for heating the aerosol as it passes through the heating chamber without direct contact between the heater and the aerosol, heating being transferred from the heating element to liquid in the collection well via the sleeve, said aerosol in turn being heated by said liquid.

4,291,839

VEHICLE RUST-INHIBITING SPRAY GUN WITH LIGHTING MEANS

Dennis A. Brett, 9890 College Ave., Indianapolis, Ind. 46280

Filed Nov. 5, 1979, Ser. No. 91,467
Int. Cl.³ B05B *15/00*
U.S. Cl. 239—289 **9 Claims**

1. A hand-held, rust-inhibiting spray gun, comprising in combination:

(a) a grippable portion;

(b) a triggering means for applying rust-inhibiting sealant to the under and hidden surfaces of a vehicle; and

(c) a lighting means removably mounted thereto and directed to illuminate the surface receiving the rust-inhibiting application, said lighting means includes an illuminating device, said device comprising:

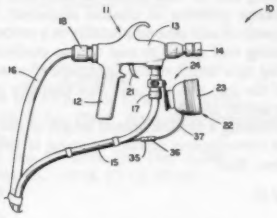
(1) a cup-shaped housing;

(2) a socket position within said housing for receiving a lighting bulb therein;

(3) electrical means for illuminating said bulb;

(4) magnetic means secured to the back of said housing for removably attaching said housing to the spray gun;

(5) a lens cover removably attached to said housing; and



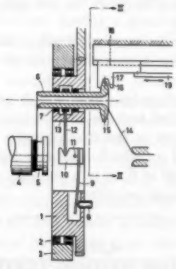
(6) an inner reflective surface for directing the light beam to illuminate the surface receiving the rust-inhibiting application.

4,291,840

DEVICE FOR THE WINDING OF COILS

Wilhelmus L. L. Lenders, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,846
Claims priority, application Netherlands, Oct. 2, 1978, 7809906
Int. Cl.³ H01F *11/04*
U.S. Cl. 242—7.14 **8 Claims**



1. Apparatus for winding a coil of wire onto a rigidly arranged coil core, which comprises a winding member rotatable about an axis; a wire guide journalled in the winding member and traversable in the direction of the axis of rotation; a structural member displaceable in the direction of the axis of rotation; and an element connected to the wire guide and cooperating over part of its circle of revolution with a surface of the structural member.

4,291,841

METHODS OF AND APPARATUS FOR TAKING UP LIGHTGUIDE FIBER

Philip W. Dalrymple; Michael J. Hyle, both of Doraville; Daryl L. Myers, Lawrenceville, and James G. Wright, Jr., Roswell, all of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,808
Int. Cl.³ B65H *54/02, 67/04*
U.S. Cl. 242—18 A **23 Claims**

1. A method of taking up lightguide fiber said method comprising the steps of:

supporting each of a first and second plurality of spools for rotation about an axis, said axes of rotation of said spools of each plurality being parallel;

mounting each plurality of spools for revolution about an

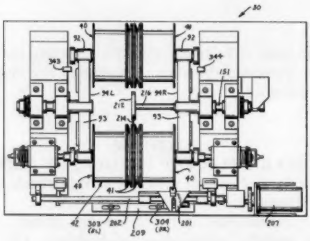
axis which is parallel to the axes of rotation of spools of said plurality, said axes of rotation of said spools of each plurality being spaced equal distances from the axis of revolution of said each plurality;

holding one of said spools of said first plurality in a first takeup position in coaxial alignment with one of said spools of said second plurality in a second takeup position;

rotating said spools in said takeup positions;

taking up a length of the lightguide fiber adjacent one flange of the one spool of said first plurality in said first takeup position; then

distributing a predetermined length of the fiber in a plurality of convolutions across the spool in the first takeup position; then



causing a length of the fiber to be taken up adjacent to one flange of the spool in the second takeup position, said one flange of the spool in the second takeup position being adjacent the one flange of the one spool in the first takeup position; then

distributing a predetermined length of the fiber in a plurality of convolutions across the spool in the second takeup position;

severing the lightguide fiber which extends between the spools in the first and the second takeup positions; and

causing revolution of the first plurality of spools to move said one spool on which has been distributed said predetermined length of fiber in a plurality of convolutions out of the first takeup position.

4,291,842

SPINDLE FOR WINDING TEXTILE YARNS

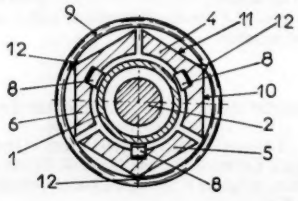
Bernard Isoard, Ecully, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Oct. 15, 1979, Ser. No. 84,828

Claims priority, application France, Oct. 13, 1978, 78 29476

Int. Cl.³ B65H *54/54*

U.S. Cl. 242—46.5 **4 Claims**



1. A winding spindle adapted to support and drive in rotation therewith at least one winding support on which a textile yarn is to be wound, comprising at least one rotary spindle body and at least one gripping means for gripping the winding support mounted on the spindle body, wherein the gripping means comprises at least two flyweights regularly distributed around the spindle body, radially mobile and able to come in contact at least with the inside surface of the winding support and to develop, under the effect of centrifugal force, a radial thrust assuring its gripping; wherein the outside surface of each flyweight presents flat parts, the intersection of two successive flat parts constituting an edge extending roughly along a generatrix of the inside of the support, and wherein the outside surface of the flyweights includes at least one pointed projection, each pointed projection being located on said edge, the height of said pointed projections being on the order of tenths of a millimeter, and the profile of said projections being trapezoidal or triangular in the longitudinal direction, said pointed projection being able to penetrate into the wall of the support when the spindle is rotating, thereby improving the holding of the support in the radial rotation and in the axial directions, and allowing the winding support to be easily disengaged from the gripping means and spindle body when the latter is at rest.

4,291,843

WEB WINDING APPARATUS

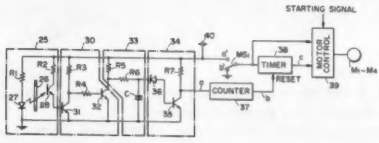
Hitoshi Yanagawa, Tokyo; Motofumi Konishi, Yokohama; Yoshio Ando, Chigasaki, and Kazuo Kashiwagi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,594

Claims priority, application Japan, Jul. 13, 1978, 53-85745

Int. Cl.³ B65H *25/32*

U.S. Cl. 242—57 **12 Claims**



1. A web feeding apparatus comprising:

a drive source;

a take-up reel driven from said drive source;

means for feeding a web to said take-up reel along a predetermined path;

means for winding the web around said take-up reel;

pulse generating means for generating a pulse for each predetermined amount of angular rotation of said take-up reel;

timer means operable in response to arrival of the web at a predetermined position in said path;

signal generating means for intermittently generating signals at an interval when the interval of the pulses generated by said pulse generating means becomes longer than a predetermined pulse interval;

counting means for counting the signals generated from said signal generating means, said counting means putting out a signal for resetting said timer means when the number of the counted signals reaches a predetermined value; and

means for stopping said feeding means when said timer means, before the number of the counted signals reaches a predetermined value, operates for a set time period.

4,291,844

SHAFTLESS REWIND CHUCK

Michael Blickley, Manville, and Nicholas G. Naccara, Hewitt, both of N.J., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Apr. 28, 1980, Ser. No. 144,443

Int. Cl.³ B65H *75/24*

U.S. Cl. 242—68.2 **11 Claims**

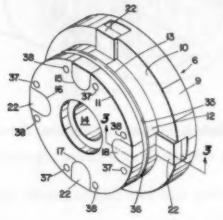
1. A chuck for engaging and holding the open end of a hollow tube on which a web of material is spirally wound, comprising:

(a) a cylindrical hub extending coaxially from a cylindrical flange which has a larger inside diameter than the hub;

(b) a plurality of slots arcuately spaced in the hub and flange,

the slots being radially oriented relative to the longitudinal axis of the hub, each of the slots having a pair of surfaces wherein the included angle between a pair of intersecting planes containing at least portions of said surfaces is substantially 90°;

(c) a sear disposed in each of the spots and shaped to rock therein in a radial plane relative to the longitudinal axis of the hub, each sear comprising a pair of legs which are angularly disposed to each other and joined for unitary movement, the first of the pair of legs resting in a portion of the slot mainly in the hub and the second of the pair of legs resting in a portion of the slot mainly in the flange, each slot and sear therein being shaped so that, firstly, the



first leg is free of contact with a hollow tube surrounding the hub, when the tube is free of engagement with the second leg, and, secondly, the first leg correspondingly moves into tighter engagement with the inner periphery of a hollow tube surrounding the hub, as the tube engages and moves the second leg in the direction of the flange sufficient to rock the sear and, each of the sears having a pair of matingly configured surfaces wherein the included angle between a pair of intersecting planes containing at least portions of said surfaces of the sear is less than 90°, so that said surfaces of the sears will alternately engage matingly configured surfaces of the slots; and

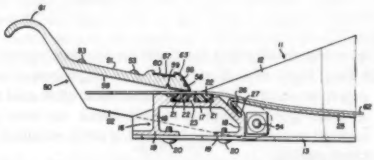
(d) means for retaining the sears in the slots during rotation of the chuck.

4,291,845

COIL CRADLE

Eugene H. Van Cleave, Orchard Lake, Mich., assignor to Van Mark Products Corporation, Farmington Hills, Mich.

Filed Mar. 27, 1980, Ser. No. 134,510
Int. Cl.³ B21C *47/16*
U.S. Cl. 242—78.7 **9 Claims**



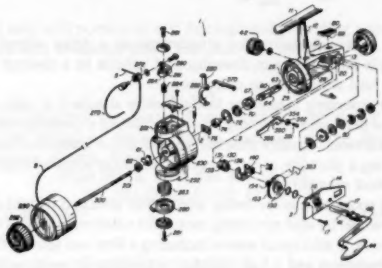
1. A coil cradle for a coil of sheet material comprising an open-topped tray having side walls, a pair of support rollers bridging the side walls adjacent one end of the tray and spaced from one another to support a sheet material coil superimposed thereon, a support element bridging the side walls adjacent the other end of the tray and having an upper support surface for sheet material from the coil, a tray bottom of normally planar sheet material, the tray bottom having one edge fixedly secured to the tray beneath the rolls and the remainder of the bottom projecting toward the support element, and retaining means securing the tray bottom free edge to the support at a distance from the one secured bottom edge which is less than the unconfined planar length of the bottom, so that the bottom assumes a curved configuration for guiding the sheet material from the coil to the support element.

4,291,846

ROTOR BRAKE FOR FISHING REEL

Robert L. Carpenter, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 17, 1979, Ser. No. 76,348
Int. Cl.³ A01K *89/02, 89/00*
U.S. Cl. 242—84.2 G **21 Claims**



1. In an open face spinning reel used for casting a bait attached to a fishing line and for retrieving the bait and fishing line after casting, the reel having a housing with a front forward spool end face, a back end and a central passageway extending from the face to the back end defining a central axis, a pinion assembly mounted in the housing, a central shaft rotatably mounted in the housing and coaxial with the central axis, a spool mounted on the shaft for holding the fishing line, a handle and gear train assembly mounted in the housing, a rotor having a bail for winding the fishing line about the spool in the retrieving position coaxial with the central axis and mounted adjacent the face and rotatable by cooperative movement of the gear train and pinion assemblies, a movable bail mounted on the rotor having an open casting position and a closed retrieving position, improvement being an internally mounted mechanism for preventing inadvertent or undesirable rotation of the rotor when the bail is in a casting position comprising:

(a) a brake drum mounted on the forward face of the housing coaxial with the central axis;

(b) the rotor comprising:

(1) a central desk having a front opening cylinder extending toward the front end of the reel and a back opening cylinder extending toward the back of the reel having an internal bowl, the front and back cylinders having an external surface,

(2) pivot means secured to the external surface of the cylinders,

(3) the rotor mounted such that the bowl surrounds the brake drum;

(c) a U-shaped bail with two ends;

(d) first and second bail arms, each of the bail ends mounted in a bail arm, the bail arms mounted to the pivot means;

(e) elongated trip lever means slidably mounted on the deck having a cam follower and a trip end, the lever means being substantially perpendicular to the central axis;

(f) means for biasably urging the cam follower toward the central axis; and,

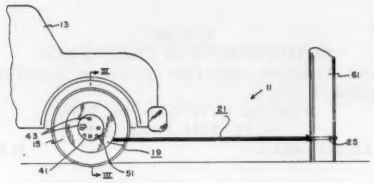
(g) brake means mounted in the trip lever means and pressing against the brake drum for limiting the free rotation of the rotor when the bail is in the casting position.

4,291,847

WINCH MEANS

James C. Gilbert, 8355 Greenbrook, Southaven, Miss. 38671

Filed Aug. 1, 1980, Ser. No. 174,361
Int. Cl.³ B65H *17/46*
U.S. Cl. 242—95 **3 Claims**



1. A winch means for attachment to a drive wheel of a vehicle and for use in drawing said vehicle to a desired location, said winch means comprising:

(a) mounting means for being fixedly attached to said drive wheel, said mounting means including a plurality of bolt members fixedly attached to said drive wheel and including a plurality of nut members for being screwed onto said bolt members;

(b) spool means for being selectively attached to said drive wheel by said mounting means for rotation with said drive wheel, said spool means including a first and second flange members and a hub member extending between said first and second flange members, said first flange member of said spool means having a plurality of apertures therethrough for allowing said bolt members of said mounting means to extend therethrough and for allowing said spool means to be attached to said drive means with said bolt members of said mounting means passing through said apertures in said first flange member and with said first flange member sandwiched between said drive wheel and said nut members of said mounting means; and

(c) cable means having a first end for being attached to said spool means and having a second end for being selectively anchored to said desired location, rotation of the drive wheel causing said cable means to wind about said spool means and causing said vehicle to be drawn to said desired location, said spool means being capable of being disengaged from said mounting means after said cable means is fully wound onto said spool means.

4,291,848

MISSILE SEEKER OPTICAL SYSTEM

Keith E. Clark, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

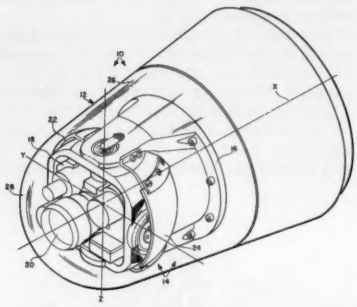
Filed Sep. 13, 1974, Ser. No. 506,499
Int. Cl.³ F41G *7/26*
U.S. Cl. 244—3.16 **6 Claims**

1. In a guided missile seeker system including; a dome window, a gimbal mechanism fixed within said dome window, an objective lens mounted on said gimbal mechanism for movement in three degrees of freedom through an angle greater than 90°, and detector means receiving radient energy passing through said dome window and said objective lens, the improvement comprising:

said dome window being formed by a spherical portion and a conical portion;

said conical portion having inner and outer surfaces tangent to inner and outer surfaces respectively of said spherical portion at the point of attachment thereof and said surfaces of said conical portion being tapered from said point of attachment rearwardly to a thinner aft end; and

corrector lenses fastened to said gimbal mechanism and covering the area scanned by said objective lens when the



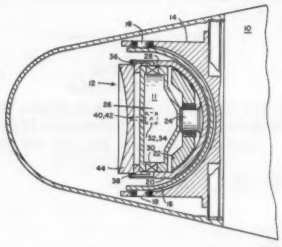
objective lens is looking throughout the conical portion of the dome.

4,291,849

REACTION-JET TORQUER

Aubrey Rodgers, Huntsville, and Escar L. Bailey, Athens, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 4, 1979, Ser. No. 35,955
Int. Cl.³ F41G *7/20*
U.S. Cl. 244—3.22 **2 Claims**



1. In a missile disposed for flight to a target, apparatus for controlling flight of said missile to said target comprising:

a. a gyro assembly including a frame secured to said missile, an outer gimbal secured to said frame, an inner gimbal secured to said outer gimbal, and, a rotor mounted in said inner gimbal;

b. reaction-jet torquer means carried in said inner gimbal for torquing said rotor to line of sight with said target, said reaction jet torquer means including a source of pressurized gas carried in said inner gimbal, four sonic nozzles spaced about said inner gimbal 90° apart, four miniature electrically actuated solenoid valves disposed about said inner gimbal 90° apart, each said valve disposed in communication with said source of gas and one of said nozzles;

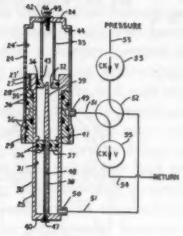
c. a sensor carried by said inner gimbal for receiving signals from said target and for transmitting signals for activation of said reaction-jet torquer means, and;

d. control means for guiding said missile to the target response to torquing of said rotor.

4,291,850
CONTRACTABLE SHOCK ABSORBER STRUT

Wilbert Sharples, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Mar. 19, 1979, Ser. No. 22,211
Int. Cl.[3] B64C *25/10, 25/58*
U.S. Cl. 244—102 SS 7 Claims



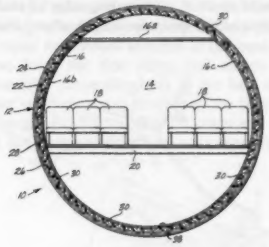
1. A contractable single acting shock absorber strut comprising:
an outer cylinder closed at one end and open at the other end;
a centrally open bearing defining the open end of said cylinder;
a strut piston mounted for reciprocation in said cylinder and extendable therefrom through said centrally open bearing, said strut piston being closed at its extendable end and open at its other end whereby shock absorber fluid is free to pass between the interiors of said cylinder and said strut piston;
a contracting piston slideably mounted in said cylinder externally of said strut piston;
a floating piston slideably mounted in the extendable end of said strut piston;
a first constantly open fluid port in said cylinder between said contracting piston and said centrally open bearing;
a second constantly open fluid port in said strut piston between said floating piston and the extendable end of said strut piston;
a source of hydraulic fluid pressure;
a return to said source;
a first fluid duct between each of said first and second fluid ports and said hydraulic fluid source;
a second fluid duct between each of said first and second fluid ports and said return; and
a control valve for said fluid ducts operable to selectively connect either one of said fluid ports to receive hydraulic fluid from said source and simultaneously connect the other of said fluid ports to said return whereby said floating piston may be hydraulically locked in a fixed position while said strut piston is free to reciprocate in said cylinder and may be selectively unlocked while said strut piston is fully contracted into said cylinder.

4,291,851
THERMAL INSULATION FOR AIRCRAFT FUSELAGE

William R. Johnson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 970,773, Dec. 18, 1978, Pat. No. 4,235,398.
This application Mar. 24, 1980, Ser. No. 132,717
The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.
Int. Cl.[3] B32B *3/30*
U.S. Cl. 244—119 5 Claims

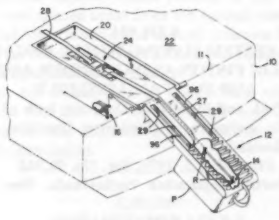
1. An insulation panel for an aircraft fuselage having a wall portion including a continuous and substantially uninterrupted inwardly-facing surface; said insulation panel comprising: a self-supporting foam panel of insulating material including an inside face, an outside face, and a plurality of standoffs projecting outwardly from said outside face for contacting said continuous and substantially uninterrupted inwardly-facing surface of said wall portion of said fuselage and providing a space between said insulation panel and said wall portion.



4,291,852
PARACHUTE RELEASE FOR CARGO AIRCRAFT

Gerald C. Simmons, Bothell, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 2, 1979, Ser. No. 54,102
Int. Cl.[3] B64D *17/62, 17/78*
U.S. Cl. 244—147 10 Claims



1. Apparatus for releasing parachutes from an aircraft comprising: arm means mounted adjacent an opening in the aircraft for movement between an inboard, face up stowed position and an outboard, face down deployed position; holder means, removably mounted on said arm means, for releasably holding a parachute; means for actuating said holder means and means for controlling said actuating means to selectively release said parachute after said arm is deployed, whereby said holder means may be attached to said parachute at a location remote from said opening and then both may be attached to said arm means while in its inboard, stowed position.

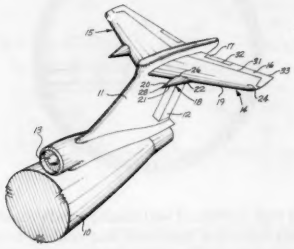
4,291,853
AIRPLANE ALL-MOVING AIRFOIL WITH MOMENT REDUCING APEX

Armand Sigalla, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 973,165, Dec. 26, 1978, abandoned.
This application May 5, 1980, Ser. No. 146,386
Int. Cl.[3] B64C *5/02, 21/00*
U.S. Cl. 244—87 22 Claims

1. An all-moving horizontal stabilizer for an aircraft, said stabilizer being rotatable with respect to a fixed portion of the aircraft to which the stabilizer is attached, said stabilizer being rotatable about a control axis extending generally spanwise of the stabilizer from said fixed portion of the aircraft, said stabilizer having a leading edge and a moment reducing apex, said apex projecting forwardly from said leading edge to a tip lying generally in the body plane of said stabilizer, said apex being spaced along said leading edge outwardly from said fixed

portion of the aircraft to avoid substantial adverse interference effects, said apex having oppositely swept inboard and outboard leading edges mutually converging forwardly toward said tip and spaced apart at said leading edge of said stabilizer by a minor fraction of the spanwise length of said leading edge,



said apex having upper and lower apex surfaces which mutually converge spanwise of the stabilizer to said inboard and outboard leading edges of said apex, whereby said apex forms counterrotating airflow vortices to reduce the moment of force required to rotate said stabilizer about said control axis.

4,291,854

RAIL SYSTEM HAVING WHEEL-ENGAGED HYDRAULIC PISTON-AND-CYLINDER ASSEMBLY, AND SUCH AN ASSEMBLY

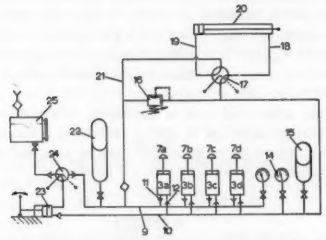
Cornelis P. Pelt, and Hendrikus De Jong, both of Castricum, Netherlands, assignors to Hoogovens Ijmuiden, B.V., Ijmuiden, Netherlands

Filed Nov. 5, 1979, Ser. No. 91,342

Claims priority, application Netherlands, Nov. 15, 1978, 7811280

Int. Cl.³ B61L *1/00, 11/06*

U.S. Cl. 246—271 **8 Claims**



1. A rail system for vehicle transport having

(a) a rail track of spaced apart parallel rails,

(b) a set of points,

(c) hydraulically operated means for switching said set of points,

(d) a hydraulic piston-and-cylinder assembly located next to one of said rails of said rail track and having an element projecting into the path of the rail wheels of a rail vehicle passing on said track to be engaged thereby so that the said assembly is actuated by passage of a rail vehicle to provide pressurised fluid, and

(e) a pressure line connecting said piston-and-cylinder assembly to said points switching means whereby said pressurised fluid from the assembly is usable to operate the points switching means.

4,291,855

PIPE CLAMP

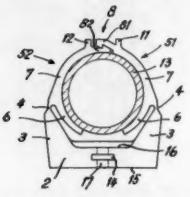
Willi Schenkel, Zurich, and Hans Seger, Schwerzenbach, both of Switzerland, assignors to Egli, Fischer & Co. AG, Zurich, Switzerland

Filed Mar. 14, 1977, Ser. No. 777,526

Claims priority, application Switzerland, Mar. 15, 1976, 3168/76

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—74 A **9 Claims**



1. A pipe clamp for clamping a pipe comprising:

an essentially rigid attachment component including a pair of essentially rigid protruding arms with end portions terminating at respective hinge means;

a pair of clamp segments capable of being releasably interconnected with one another carried by said protruding arms;

each clamp segment having upper, lower and intermediate sections;

hinge means positioned between said end portion of each protruding arm and said intermediate section of said clamp segment for pivoting said clamp segment with respect to said protruding arm when said lower section of said clamp segment is engaged by said pipe being clamped;

said upper section of each clamp segment which faces away from the attachment component having its end provided with a locking part cooperating with the locking part at the end of the other clamp segment;

said cooperating locking parts providing locking means for releasably interconnecting said clamp segments,

said locking means being automatically actuatable by the insertion of said pipe into said clamp segments whereby said inserted pipe is engaged in secured relationship within said clamp segments.

4,291,856

ASSEMBLY OF A SEAT FRAME, SLIDE RAILS AND A LOCKING DEVICE

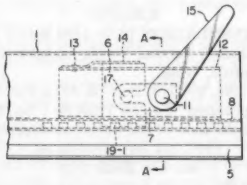
Muneharu Urai, Tokyo, Japan, assignor to Tachikawa Spring Co. Ltd., Tokyo, Japan

Filed Oct. 5, 1979, Ser. No. 82,328

Claims priority, application Japan, Oct. 9, 1978, 53-123564

Int. Cl.³ A47C *29/00*

U.S. Cl. 248—429 **8 Claims**



1. An assembly of a seat frame, slide rails and a locking device, which comprises a rectangular side frame for mounting a cushion material thereon, said rectangular side frame being opened at its lower face, a rectangular upper rail secured

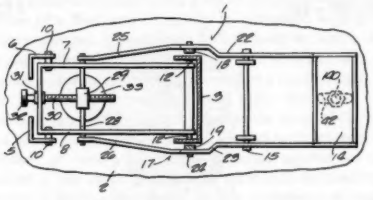
within the lower portion of said side frame, said side rail being partly open at its lower face said upper rail having therein sliders with inwardly open grooves, a rectangular reinforcing casing arranged in said side frame above said sliders, said reinforcing casing having slots at its upper and lower faces, a pair of C-shaped lower rails arranged in back-to-back relation with each other and fixed to a chassis of an automobile, said lower rails being slidably engaging with said grooves of said sliders for allowing the longitudinal movement of said upper rail and side frame, said lower rails also having upper tooth engaging portion thereon, a stopper inserted into said slots of said reinforcing casing and having teeth engageable with said tooth engaging portion at its lower end, said stopper with teeth and said reinforcing casing with slots constituting said locking device which is concealed within the inner space of said seat frame, said concealed locking device being engageable with said tooth engaging portion formed in said pair of C-shaped lower rails, said stopper being movable vertically by the action of a handle, thereby enabling the longitudinal movement of said side frame and the engagement between said teeth and tooth engaging portion at any position to hold the seat at the selected position.

4,291,857

VEHICLE SEAT SUSPENSION

David S. Totten, Greendale, and Thomas J. Worringer, Wauwatosa, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 9, 1979, Ser. No. 92,673
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—559 **10 Claims**



1. A vehicle seat suspension system on a vehicle supporting a seat comprising, a vehicle chassis, a seat adapted for carrying an operator and movably mounted relative to said vehicle chassis permitting essentially vertical movement, resilient means and damping means connected between said seat and said vehicle chassis for resisting relative movement between said seat and said chassis from a neutral position, a lever having a weighted end pivotally connected to said seat and pivotally mounted on said vehicle chassis and extending generally transverse from the direction of movement of said seat producing inertia forces operating with forces of said resilient means and said damping means for absorbing vibrations with a minimum of transmissibility across the seat suspension at predetermined frequencies of vibration, a variable leverage means for varying the leverage of said weighted lever, a seat load adjusting means operating said variable leverage means and adjustably positioning said resilient means and said damping means to thereby compensate for varying seat loads.

4,291,858

CLIP APPARATUS FOR CONCRETE FOUNDATION FORMS

Kenneth L. NeSmith, 12936 E. Galveston, Chandler, Ariz. 85224

Filed May 27, 1980, Ser. No. 153,071
Int. Cl.³ E04G *17/00*
U.S. Cl. 249—216 **16 Claims**

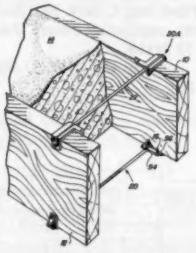
1. Form clip apparatus for securing together in a spaced apart relationship a pair of concrete forms comprising, in combination:

base element means having a single structural member;

first outer end means secured to the base element means and extending substantially perpendicularly thereto;

second outer end means secured to the base element means remote from the first outer end means and extending substantially perpendicularly to the base element means;

first inner support means secured to the base element means and spaced apart from the first outer end means, the first outer end means and the first inner support means adapted



for receiving and supporting a portion of a first concrete form therebetween;

a second inner support means secured to the base element means and spaced apart from the second outer end means for receiving a portion of a second concrete form therebetween for holding the first and second concrete forms in a spaced apart relationship; and

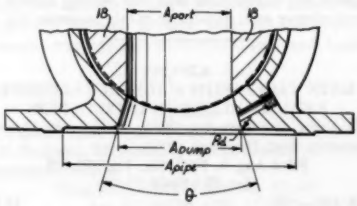
alignment tab means secured to the base element means adjacent the first and second inner support means for aligning the first and second concrete forms in a predetermined relationship.

4,291,859

PLUG-TYPE VALVE

Javed Qasim, Diamond Bar; Samuel C. Walker, Fullerton, and Paul A. Longwell, Encinitas, all of Calif., assignors to Aerojet-General Corporation, La Jolla, Calif.

Filed Dec. 10, 1979, Ser. No. 101,625
Int. Cl.³ F16K *5/00*
U.S. Cl. 251—123 **5 Claims**



1. In an improved plug valve apparatus of the type having an inlet, an outlet, and a plug mechanism connected between the inlet and the outlet for selective control of fluid flow between upstream and downstream pipes of cross-sectional area, A_{pipe}, and to which the valve is adapted for connection, the inlet and the outlet each defining a diffuser of equivalent conical angle ϕ and of substantially diverging cross-section with the smallest cross-sectional area thereof, A_{port}, located at the diffuser port adjacent the plug mechanism and the largest cross-sectional area thereof, A_{dump}, located at the diffuser port adapted for connection to a pipe by a transition region between A_{dump} and A_{pipe}, having a transition radius R_d, the improvement comprising:

said valve apparatus in which said transition radius R_d is in the range of 6% to 15% of the diameter of a circle equivalent in area to A_{port}; in which each said diffuser equivalent conical angle ϕ is in the range of 15° to 30°; in which the ratio of A_{dump} to A_{pipe} is in the range of 0.55 to 0.70; and in which the ratio of A_{port} to A_{pipe} is in the range of 0.50 to 0.60.

4,291,860

SOLENOID VALVES, PARTICULARLY FOR CARBURETORS

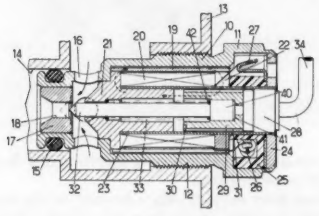
Philippe Bauer, Marly le Roy, France, assignor to Societe Industrielle de Brevets et d'Etudes, Paris, France

Filed Jun. 7, 1979, Ser. No. 46,266

Claims priority, application France, Jun. 28, 1978, 78 19339; Oct. 12, 1978, 78 29156

Int. Cl.³ F16K *31/06*

U.S. Cl. 251—129 **9 Claims**



1. In a solenoid valve comprising:

housing means having a fluid flow opening,

a movable assembly having a first end position and a second end position,

a return spring operatively associated with said movable assembly for biasing it toward said first end position,

an electromagnetic coil carried by said housing and operatively associated with said movable assembly for bringing said movable assembly to said second end position when energized,

said movable assembly comprising an armature and a needle, abutment of said armature with the housing means determining one of said end positions in which said needle defines with said opening a passage of minimum non zero cross sectional area,

the improvement wherein said armature includes a radial bearing surface, and means for continuously biasing said needle into engagement with said bearing surface to prevent relative axial movement of said armature and needle.

4,291,861

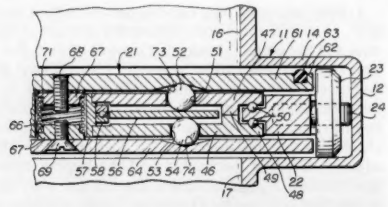
GATE VALVE WITH SLIDEABLE CLOSURE EXPANDABLE UPON OSCILLATION

Carl R. Faria, San Leandro, Calif., assignor to Thermionics Laboratory, Inc., Hayward, Calif.

Filed Aug. 4, 1980, Ser. No. 175,129

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—158 **13 Claims**



1. A gate valve comprising an elongated casing having sides, top, bottom, and first and second ends, first and second ports in said sides adjacent said first end positioned in line, a closure within said body moveable between said first and second ends, and actuating means for moving said closure, said closure comprising a body, a cage in said body having an upper section and a lower section and mounted in said body for arcuate movement relative to said body, rotary elements caged in said upper section extending partially out of said upper section, a gate plate adjacent said upper section formed with depressions positioned to receive said rotary elements, resilient means biasing said gate plate toward said upper section, and cage moving means for imparting arcuate movement to said cage relative to said body and thereby to roll said rotary elements out of said depressions to force said gate plate away from said upper section and into sealing engagement with said first port.

4,291,862

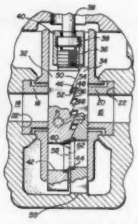
EXPANDING GATE VALVE

Patricio D. Alvarez, Rosenberg; James M. Fowler, Marble Falls, and George A. Moran, Houston, all of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,682

Int. Cl.³ F16K *25/00*

U.S. Cl. 257—167 **8 Claims**



1. A gate valve structure comprising:

a valve body having a valve chamber therein and inlet and outlet flow passages communicating with the valve chamber;

an expanding valve assembly mounted within the valve chamber for reciprocal movement between open and closed positions relative to said flow passages, said expanding valve assembly including a gate and a segment expanding away from each other at the fully closed position, a stem connected to said gate for movement of said gate between the open and closed positions;

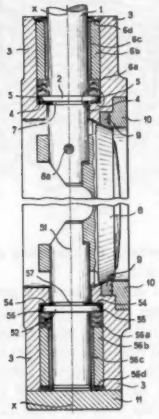
said gate and segment having ports therein adjacent one end thereof alignable with said flow passages in the open position of said valve assembly;

said segment and gate having a plurality of contiguous interfitting teeth formed therein between the other end thereof and said ports thereof, said teeth providing a plurality of cam surfaces to effect expansion of the valve assembly upon relative longitudinal movement in one direction between the gate and segment, said segment being carried by said gate and engaging a stop at the fully closed position thereof to permit subsequent relative longitudinal movement of the gate and lateral expansion of the valve assembly at said fully closed position.

4,291,863
ANTIFRICTION DEVICE FOR A VALVE CONTROL SHAFT

Jean Gachot, 26 bis, avenue de Paris, 95230 Soisy Sous Montmorency, France

Filed Oct. 9, 1979, Ser. No. 82,478
Claims priority, application France, Oct. 17, 1978, 78 29546
Int. Cl.³ F16K *1/22, 41/04*
U.S. Cl. 251—214 6 Claims



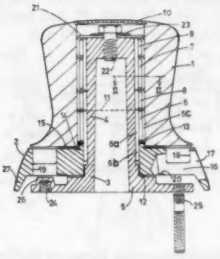
1. An antifriction device for a valve which serves to regulate the flow of a fluid and especially to withstand high pressures and temperatures, comprising a hollow body to which the fluid inlet and outlet pipes are connected and in which is rotatably mounted a closure member connected to a control shaft having a part extending externally of said body through a packing gland seal, the shaft being provided at the level of the packing gland seal with an annular flange applied with interposition of a washer of creep-deformable material against an annular shoulder of the valve body which surrounds the control shaft, wherein a groove is formed in the periphery of said shaft opposite to said washer, said groove being adapted to receive the washer material after creep deformation of the same in response to high temperature or high pressure to which the valve is subjected, said groove limiting the amount of said creep-deformation.

4,291,864
DRUM WINCHES

Darcie F. Reynolds, 5 Duke St., Forestville, New South Wales 2087, Australia

Filed Jul. 24, 1979, Ser. No. 60,005
Claims priority, application Australia, Jul. 26, 1978, PD5237
Int. Cl.³ B66D *1/30*
U.S. Cl. 254—375 15 Claims

1. A winch for a yacht comprising:
(a) a supporting shaft structure,
(b) roller clutch means mounted on the shaft structure,
(c) a drum mounted over the roller clutch means and rotatable thereon in a first direction about the shaft structure but restrained by the clutch means against rotation in the opposite rotary direction,
(d) seal means for sealing the roller clutch means from the exterior of the winch, and
(e) the roller clutch means being dimensioned to have a yieldable interference fit between an exterior case member of the roller clutch means and a central bore in said drum, with lubricant disposed between said exterior case member and said central bore, whereby if the load applied to the drum in said opposite rotary direction exceeds a predetermined value, creepage at the interference fit will occur,

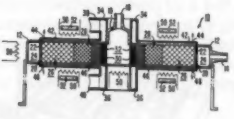


said predetermined value being less than that which would damage the roller clutch means.

4,291,865
RADIAL COLD TRAP

Brian R. Grundy, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 22, 1980, Ser. No. 142,785
Int. Cl.³ C21B *3/04*
U.S. Cl. 266—227 8 Claims



1. A liquid metal cold trap for removing impurities from a liquid metal stream comprising:
a housing; and
a plurality of concentrically arranged annular mesh bands disposed within said housing with each of said mesh bands having its radial centerline in substantially the same plane whereby said liquid metal stream flows successively substantially radially through each of said mesh bands thereby trapping said impurities in said mesh bands.

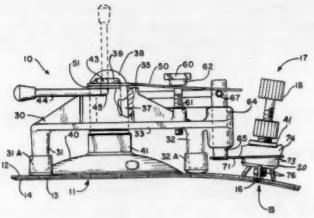
4,291,866
SUPPORT FOR WINDSHIELD REPAIR APPARATUS

Paul S. Petersen, Minnetonka, Minn., assignor to Novus Inc., Minneapolis, Minn.

Filed Nov. 13, 1979, Ser. No. 93,197
Int. Cl.³ B25B *3/00, 11/00*
U.S. Cl. 269—1 19 Claims

1. A support assembly for supporting an apparatus on a surface such as a windshield comprising a first support member, means for supporting said first member on said surface, a second support member, said second support member including means to engage the surface and independently position and support said second support member on said surface in fixed position relative to the surface, means to mount said second support member to said first support member to permit the second member to rest on the same surface as the first member and including means permitting tilting of said second member relative to the first member whereby said second member can swivel to permit the means to engage the surface

to seek a support plane independent of the first support means, said second member including means to mechanically engage



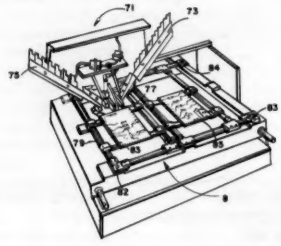
the surface, and bias means acting between the first and second members to urge the second member against the surface.

4,291,867

AUTOMATIC INSERTION UNIVERSAL WORK HOLDING SYSTEM

Ernest E. Williams, Fullerton, and William M. Brennan, Chino, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 25, 1979, Ser. No. 51,774
Int. Cl.[3] B25B *1/24*
U.S. Cl. 269—43 **26 Claims**



1. A work holding system for adjustably holding printed circuit boards for automatic machine component insertion comprising, in combination:

a U-shaped frame having opposed framing members connected by a base framing member to leave an open mouth between the opposed framing members opposite to the base framing member;

an adjustably positionable framing member entending between, and slidable along, the opposed framing members toward and away from said base framing member;

means for locking the adjustably positionable member to the frame;

linear scales carried by each of said members with said scales having a common datum;

indexing means carried by said frame to index it to said machine for inserting components;

a plurality of adjustable board holders slidably carried by the base framing member and the adjustably positionable framing member;

means for locking said board holders to their respective framing members in positions to receive said circuit boards for attaching same to said frame; and,

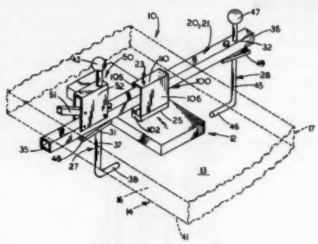
indexing means carried by at least one of said receiving board holders for indexing said boards for component insertion by said machines.

4,291,868

CLAMPING APPARATUS FOR WORK TABLE

Barry R. Giles, 1209 Burnside West, Victoria, B. C., Canada (V8Z 1N7)

Filed Dec. 10, 1979, Ser. No. 101,809
Int. Cl.[3] B25B *1/06*
U.S. Cl. 269—93 **11 Claims**



1. A clamping apparatus for clamping an item onto a work table, the apparatus including:

(a) a main support member being a generally straight bar, and a jaw member movable longitudinally of the bar and having a clamping surface adapted to contact the item,

(b) first and second engaging members extending from positions spaced along the support member, each engaging member having adjacent an outer end thereof holding means to cooperate with the work table,

(c) lever actuated jacking means having a reciprocable jacking member adapted to engage the first engaging member to move the first engaging member relative to the support member to clamp the item between the clamping surface and the work table, the jacking member also being disengagable from the engaging member to permit quick adjustment of the engaging member relative to the support member to accommodate quickly items of widely differing sizes.

4,291,869

WORKBENCH

Ronald P. Hickman, Waltham Abbey, England, assignor to Tekron Licensing B.V., De Leersum, Netherlands

Division of Ser. No. 781,841, Mar. 28, 1977, Pat. No. 4,159,821, which is a division of Ser. No. 642,742, Dec. 22, 1975, abandoned, which is a continuation of Ser. No. 511,017, Oct. 1, 1974, abandoned, which is a continuation of Ser. No. 277,118, Aug. 1, 1972, abandoned. This application Mar. 12, 1979, Ser. No. 19,753
Claims priority, application United Kingdom, Aug. 2, 1971, 36269/71; Nov. 22, 1971, 54165/71
The portion of the term of this patent subsequent to Jul. 3, 1996, has been disclaimed.
Int. Cl.[3] A47B *3/08;* B25B *1/10, 1/24*
U.S. Cl. 269—139 **10 Claims**

1. A portable combined workbench and sawhorse, comprising:

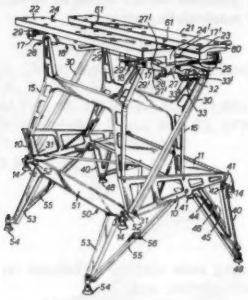
a worktop, including a unitary vise structure having a fixed jaw and a movable jaw, the upper surfaces of said jaws lying in substantially the same plane and defining the working surface of said worktop;

a collapsible supporting structure for the worktop, including means providing a first, lower position of the worktop facilitating a sawhorse mode of operation and a second, higher position of the worktop facilitating a workbench mode of operation;

clamping means operatively coupled between the fixed jaw and the movable jaw for moving the movable jaw relative to the fixed jaw in said plane to securely hold a workpiece therebetween;

each of said jaws having a plurality of apertures formed through the upper surface thereof;

a plurality of abutment members adapted to be positioned within selected ones of the apertures in the respective jaws, each abutment member including means defining at least one abutment face which is rotatable relative to the upper surface of the jaw;



the clamping means further including means for moving said movable jaw into a substantially non-parallel relationship with respect to said fixed jaw to facilitate the gripping between the abutment members of the respective jaws of an irregularly-shaped workpiece; and

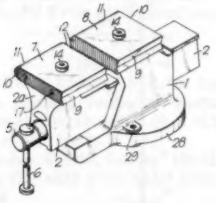
means for constraining said movable jaw against any substantial movement out of said plane during gripping of a workpiece, while permitting said movable jaw to be moved relative to said fixed jaw as aforesaid.

4,291,870

VICES

Laurence Warde, Rosevilla, Station Rd., Ballinasloe, County Galway, Ireland

Filed Nov. 28, 1979, Ser. No. 97,988
Int. Cl.³ B25B *1/24*
U.S. Cl. 269—279 **10 Claims**



1. In a vice having a pair of gripping elements, the opposing gripping surfaces of which may be brought into engagement with a workpiece located between said gripping elements, thereby to clamp the workpiece in position,

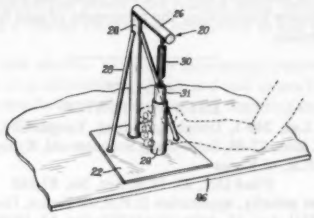
the improvement wherein at least one of said gripping elements has a gripping surface in which are provided screw threaded housings, and comprising screw threaded shanks which can be screwed home in said screw threaded housings to lie beneath the plane of said gripping surface, and which can be screwed outwardly relative to said at least one gripping element to protrude from the plane of said gripping surface, thereby to provide supports for a further gripping surface which can be suspended from the supports.

4,291,871

EXERCISING AND METHOD FOR EXERCISING FINGER, HAND AND ARM MUSCLES

Wilmot T. Lippert, 1075 E. North St., Galesburg, Ill. 61401

Filed Jul. 28, 1980, Ser. No. 173,024
Int. Cl.³ A63B *23/00, 21/30*
U.S. Cl. 272—68 **5 Claims**



1. A finger, hand and arm muscle exerciser comprising:

a base having a horizontal bottom surface for support on a table or desk top or the like in use;

a stanchion including a post extending upwardly from the base;

a coil spring suspended at the top end from the stanchion at a location spaced above the base about a vertical axis intersecting the base inside the horizontal margins thereof to provide stability therefor when pulled downwardly;

an elongated hand grip suspended vertically from the bottom end of the spring and terminating above the base to enable downward displacement by a pull on said spring;

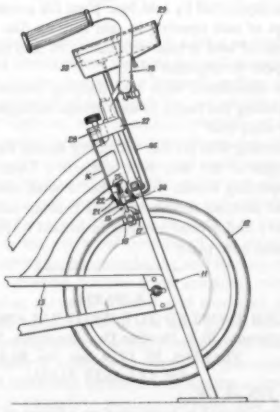
whereby the exerciser may be operated by grasping the hand grip and applying squeezing forces to the hand grip by the user's individual fingers in sequence while simultaneously pulling the hand grip downwardly during said sequence against the bias of the spring.

4,291,872

ERGOMETRIC EXERCISER WITH FLUID-ACTUATED INDICATOR

Frank P. Brilando, Niles, and Eugene J. Szymski, Skokie, both of Ill., assignors to Excelsior Fitness Equipment Co., Northbrook, Ill.

Filed Apr. 20, 1979, Ser. No. 32,242
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—73 **8 Claims**



1. A bicycle-type ergometric exerciser, comprising support

means, a wheel rotatably mounted on said support means, pedal means actuated by an operator to rotate said wheel, a frame mounted on said support means for movement relative thereto, adjustable brake means mounted on said frame for frictionally engaging said wheel and moving said frame in response to rotation of said wheel in accordance with the work rate input by an operator in actuating said pedal means, gauge means for indicating said work rate input, and hydraulic transducer means transmitting the movement of said frame to said gauge means.

4,291,873

EXERCISE DEVICE

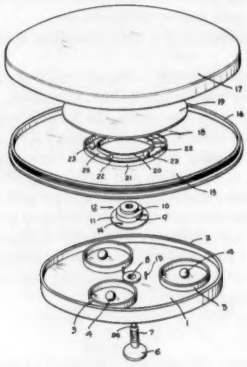
Jin W. Lee, 249-1, Dongbinggo-dong, Yongsan-ku, Seoul, and Jin S. Kim, 27-49, Sujin-dong, Songnam-shi, Kyongki-do, both of D.P.R. of Korea

Filed Oct. 23, 1979, Ser. No. 87,588

Claims priority, application D.P.R. of Korea, Dec. 22, 1978, 78-6449[U]; Jan. 12, 1979, 79-119[U]; Jan. 12, 1979, 79-120[U]

Int. Cl.³ A63B *23/04;* A63G *1/12*

U.S. Cl. 272—146 **12 Claims**



1. An exercise device comprising:

a base plate;

a turning disc mounted above said base plate for rotary and orbital movement with respect to said base plate;

bearing means interposed between said base plate and said turning disc;

said turning disc having therethrough a central opening;

means supported by said base plate for cooperation with the edge of said opening in said turning disc for limiting the range of said orbital movement of said turning disc with respect to said base plate;

means associated with said limiting means for selectively adjusting the range of said orbital movement of said turning disc; and

said turning disc further including means for supporting the weight of the user who imparts a force to said weight supporting means which reacts with said orbital movement limiting means and said bearing means to impart a rotary and orbital movement to said turning disc relative to said base plate.

4,291,874

FINGER TWIRLED TOY WITH BALANCING MASS

Mark Peterson, 20 S. Pontiac Dr., Janesville, Wis. 53545

Filed Oct. 25, 1979, Ser. No. 88,163

Int. Cl.³ A63B *71/00*

U.S. Cl. 273—1 GF **14 Claims**

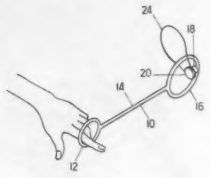
1. A toy adapted to be twirled on a finger of a user, comprising:

(a) a primary manipulating ring adapted to encircle the finger of the user of the toy in freely slidable relation,

(b) a connector extending from the primary manipulating ring for a selected distance and rigidly connected thereto,

(c) a substantially ring-shaped primary pedestal holder rigidly connected to the connector at a point remote from the primary manipulating ring,

(d) a substantially spherical pedestal rigidly attached to the primary pedestal holder so as to substantially face the primary manipulating ring,



(e) a balancing mass adapted to balance on the pedestal in removable relation, and

(f) a retaining loop of flexible material fastened to the balancing mass and looped through the primary pedestal holder, whereby the retaining loop may slide about the primary pedestal holder while the balancing mass is prevented from falling free from the toy when it is not balanced on the pedestal.

4,291,875

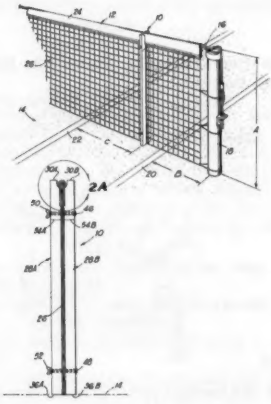
SPLIT-SINGLES STICK FOR TENNIS COURTS

Allan J. Smith, Jr., 1621 Old Springhouse La., Dunwoody, Ga. 30338

Filed Jul. 10, 1979, Ser. No. 56,322

Int. Cl.³ A63B *71/02*

U.S. Cl. 273—29 B **3 Claims**



1. A device to lift a tennis net to its regulation height above the ground for singles tennis play on a doubles court, the net being of the type having a top cable, a band surrounding the cable and netting vertically depending from the bottom of the band, comprising: a pair of rigid halves, each of said halves having a face; means on each of said faces for receiving said net therebetween; a flat lower surface on each of said halves which abuts the ground; and means for releasably securing together on opposite sides of said net said halves in an assembled condition so that said faces are in opposed relationship so as to maintain said net in a vertical plane with said net being compressed between said faces, wherein each of said receiving

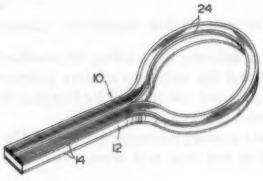
means includes each of said halves having a flat upper surface, said halves having oppositely directed, longitudinally extending arcuate grooves formed at the juncture of said upper surfaces and said opposed faces and having longitudinally extending L-shaped slots through said opposed faces beneath said grooves, said grooves defining a cavity to receive therein said cable and said slots defining a channel to receive therein said band.

4,291,876

FRP RACKET FRAME

Shigeji Hasegawa, Chiba, Japan, assignor to Hasegawa Chemical Industry Co., Ltd., Chiba, Japan

Filed Feb. 13, 1980, Ser. No. 121,053
Claims priority, application Japan, Feb. 22, 1979, 54-20074
Int. Cl.[3] A63B *49/02*
U.S. Cl. 273—73 F **1 Claim**



1. In a racket frame comprising a frame core including a handle portion, a throat portion and a head loop portion, and FRP sheets adhered to the ball-striking faces of the frame core, the improved racket frame wherein:

each of said FRP sheets is made by slicing a curved laminated body formed into the same configuration as that of the ball-striking face of the frame core by molding a straight laminated body consisting of a plurality of FRP plate elements and protective plates arranged in side-by-side relation,

each of the FRP plate elements is formed by long, continuous reinforcing rovings extending from one end of the plate element to the other end of the plate element and, while under uniform tension, being uniformly impregnated with a thermosetting resin,

said protective plates are arranged at the innermost and outermost sides of the curved laminated body, and

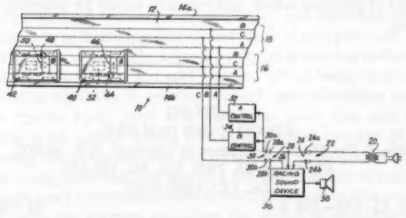
said FRP sheets are adhered to the ball-striking faces of the frame core at least in a region of said handle portion, said throat portion, and a part of said head loop portion.

4,291,877

TOY VEHICLE ENGINE SOUND DEVICE

Burt W. Ensmann, Flushing; Fredric M. Kuriloff, New York, and William Rosenhagen, Ossining, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Jan. 4, 1980, Ser. No. 109,718
Int. Cl.[3] A63F *9/14;* **A63H** *5/00*
U.S. Cl. 273—86 B **13 Claims**



1. An electric toy vehicle system of the type in which at least one controller controls electric power to at least one toy vehicle, comprising:

means for sensing current in said electric power; and

means for producing an acoustic output having a characteristic which is varied in response to said means for sensing current;

said means for sensing current including a resistor in series with said electric power, said resistor being operative to develop a voltage thereacross in response to said current; and

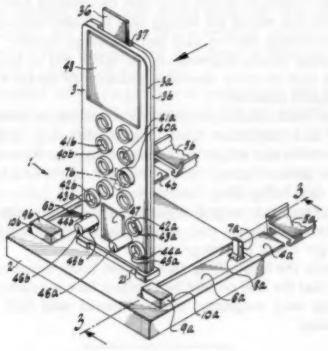
wherein said electric current is alternating current, said voltage is an alternating voltage, and said means for sensing current further includes means for detecting said alternating voltage.

4,291,878

STARTING GATE FOR A MULTIPLE-TRACK TOY VEHICLE RACING SET

Dietmar Nagel, 147 South Rd., Chester, N.J. 07930, and Melvin Kennedy, 2 Fifth Ave., New York. N.Y. 10011

Filed Aug. 17, 1979, Ser. No. 67,229
Int. Cl.[3] A63F *9/14*
U.S. Cl. 273—86 R **15 Claims**



1. A starting gate for use in connection with a multiple track toy vehicle racing arrangement for releasing self-propelled toy vehicles onto the tracks, comprising a base bounding a cavity and and having plurality of bays each for one of the vehicles and each aligned with one of the tracks; a plurality of starting elements each mounted in said cavity for independent displacement between an extended and a retracted position and each having a blocking portion retaining the respective vehicle in the respective bay in said extended position and releasing said respective vehicle for travel from said respective bay onto the respective track in said retracted position of said starting element, and an actuating portion displacing said starting element at least into said retracted position upon actuation; means for biasing said starting elements toward said extended position including a leaf spring mounted on said base within said cavity and acting on the respective starting element, first indicating means for indicating a countdown sequence preceeding the start; and second indicating means for indicating a premature displacement of a respective starting element into said retracted position prior to the termination of said countdown sequence.

4,291,879

BALL HITTING GAME

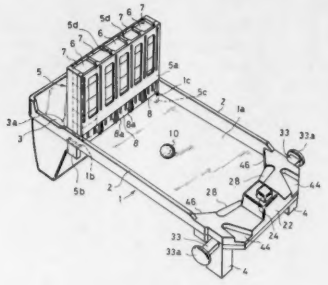
Nobuo Nagato, Tokyo, Japan, assignor to Ohkuma Seisakusho Co., Ltd., Japan

Filed May 15, 1980, Ser. No. 150,008

Claims priority, application Japan, Aug. 11, 1979, 54-110936[U]

Int. Cl.³ A63D *3/02*

U.S. Cl. 273—119 R **12 Claims**



1. A toy for playing a ball-hitting game comprising,

a body member having a ball-rolling face on which a ball may be rolled;

ball container means disposed on one end of said ball-rolling face to store said ball therein;

ball discharge means for discharging said ball stored in said ball container means onto said ball-rolling face;

ball-hitting means for hitting said ball discharged onto said ball-rolling face by said ball discharge means;

magazine means disposed on the other end of said ball-rolling face to store therein a plurality of target blocks in a stacked relation;

target block discharge means disposed on the lower portion of said magazine means for discharging target blocks stored in said magazine means one by one from said magazine means through an impinging force of said ball rolling on said ball-rolling face; and

pocket means arranged adjacently to said magazine means to receive each of said target blocks discharged by said target block discharge means;

wherein the ball-rolling face of said body member is sloped so that the ball on said ball-rolling face is ordinarily rolled from said magazine means toward said ball container means.

4,291,880

SHUFFLEBOARD CUE WITH REPLACEABLE RUNNER

Earl G. Caunter, Kimbolton, Ohio, assignor to Allen R. Shuffleboard Company, Seminole, Fla.

Filed Dec. 15, 1978, Ser. No. 970,030

Int. Cl.³ A63B *71/00*

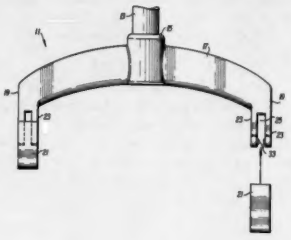
U.S. Cl. 273—129 L **9 Claims**

1. A shuffleboard cue head for propelling a disk along a shuffleboard court comprising:

a forked frame adapted for mounting to a handle, said frame including forwardly extending arms having first coupling means at the ends thereof for pivotally coupling detachable contact elements to the ends of said arms;

detachable contact elements mounted on said arms, said detachable contact elements including second coupling means for engaging said first coupling means of said arms to thereby pivotally mount said detachable contact elements to said arms, said first and second coupling means allowing said contact elements to be easily snapped onto and off of said arms;

one of said first and second coupling means including a pair of laterally spaced cantilevered resilient members and the other including a web for insertion between said cantilevered resilient members, one of said first and second coupling means including protrusions which engage recesses in the other of said coupling means, and one of said coupling means including a shoulder and the other including



a shoulder follower for guiding the cantilevered resilient members and the web into relative positions when they are urged toward one another for bringing the protrusions and recesses into engagement;

whereby said contact elements can be quickly attached and detached to and from said arms.

4,291,881

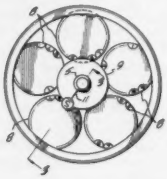
KALEIDOSCOPIC GAME DEVICE

Reuben B. Klamer, 969 Hilgard Ave., Los Angeles, Calif. 90024

Filed Nov. 5, 1979, Ser. No. 91,052

Int. Cl.³ A63F *5/04*

U.S. Cl. 273—142 H **5 Claims**



1. A kaleidoscopic game device for the generation of randomly selected data, said device comprising a circular housing; a base wheel rotatable within said housing upon needle means attached to said housing; a recessed portion in said housing, said recessed portion located annularly about the interior periphery of said housing above said base wheel; a plurality of wheels having data thereon, said wheels having a diameter less than the radius of said base wheel, one edge of each said wheel resting in said recessed portion of said housing and the opposite edge of each said wheel resting on said base wheel such that each said wheel is freely confined and rotatable upon movement of said base wheel; and indicator means for selecting said data.

4,291,882

BINGO CARD HOLDER

Samie J. Del Monte, 84 Sunset St., Buffalo, N.Y. 14207

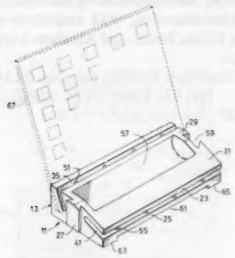
Filed Aug. 25, 1980, Ser. No. 180,837

Int. Cl.³ A63F *9/00*

U.S. Cl. 273—148 A **12 Claims**

1. A holder for a plurality of bingo cards to be played simultaneously by a single player which comprises a body having at

least a pair of holding means, each of which is capable of supporting a bingo card, with such cards being holdable so that



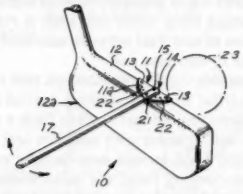
one is substantially horizontal and another is substantially vertical.

4,291,883

ADJUSTABLE PUTTER BLADE SIGHT

Isaac W. Smart, and Ethel D. Smart, both of Cass City, Mich.

Filed Jun. 9, 1980, Ser. No. 157,664
Int. Cl.³ A63B *53/00*
U.S. Cl. 273—163 R **2 Claims**



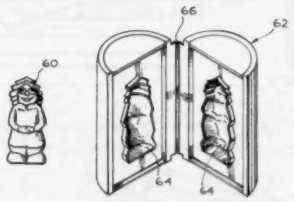
1. An adjustable putter blade sight, comprising, in combination, a mounting plate, secured to the top surface of the blade of a golf club, a cylindrical member pivotally secured, at one end, to said mounting plate, a spring and a ball secured in said cylindrical member, providing detent means for rendering said cylindrical member stationary at various degrees on said mounting plate, and a sight rod, removably received in said cylindrical member; said mounting plate being secured to the top surface of said blade of said gold club by suitable screw fasteners, one at each end, adjacent to the striking face of said blade of said golf club, and one end of said cylindrical member is secured, by a transverse pivot pin, to said mounting plate, adjacent to said striking face of said blade of said golf club, and said transverse pivot pin is fixedly secured in said top surface of said mounting plate; and said ball and spring being freely received in a transverse opening through said cylindrical member, spaced apart from said transverse pivot pin, and said spring urges against a plug fixedly secured in one end of the opening receiving said ball and spring, and the opposite end of said spring urges said ball into any one of a plurality of radially spaced-apart recesses included in the top surface of said mounting plate, the recesses providing the means of adjusting said cylindrical member to any desired angle with respect to said striking face of said blade of said golf club.

4,291,884

BOARD GAME APPARATUS AND METHOD OF PLAYING

Sidney Bass, Los Angeles, and Gary W. Pimentel, Fountain Valley, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 13, 1979, Ser. No. 103,140
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—249 **5 Claims**



2. A game comprising a plurality of playing pieces which include material which may be molded, deformed, and remolded during the game;

a game path having a plurality of positions to which the playing pieces are moved, certain of said positions requiring variation in the play of the game depending on the physical characteristics of the playing pieces landing thereon;

means for determining the number of positions over which a playing piece is to be moved;

means for changing the physical characteristics of playing pieces landing on certain of the positions; and means for measuring the physical characteristics of the playing pieces so that the play of the game is affected by the measured change of the pieces.

4. A method of playing a game comprising the steps of molding playing pieces of different colored deformable materials, moving such playing pieces in accordance with game instructions along a game path defined by a number of positions some of which are colored, distorting the shape of playing pieces which land on positions along the game path colored to match those of an opposing playing piece, and measuring the size of a playing piece to determine its movement.

4,291,885

BALL RECOVERY SYSTEM

Robert S. Cohen, 15021 Lemay St., Van Nuys, Calif. 91405

Filed Sep. 4, 1979, Ser. No. 72,192
Int. Cl.³ F41J *1/00*; A63B *63/08, 69/00*
U.S. Cl. 273—347 **8 Claims**

1. A recreational device, comprising:

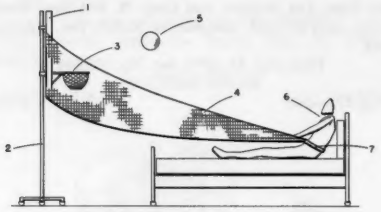
(a) A backboard;

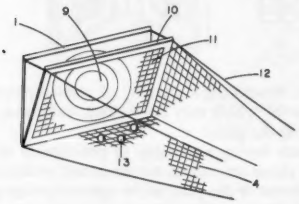
(b) A frame connected to the said backboard on the lower edge with a hinge device and resting flush with the said backboard;

(c) A screen connected within said frame;

(d) A flexible line connected to the top of said frame;

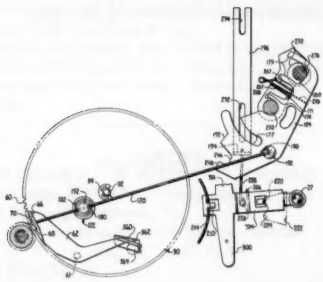
(e) An open top trough recovery device connected to said backboard;





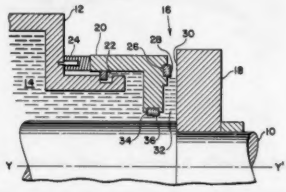
(f) A strap connected to said recovery device;
(g) A set of adhesive coated balls.

4,291,886
AUTOMATIC RECORD CHANGER
James T. Dennis, P.O. Box 15100, Oklahoma City, Okla. 73115, and George Kolomayets, Chicago, Ill., assignors to James T. Dennis, Oklahoma City, Okla.
Continuation of Ser. No. 813,225, Jul. 5, 1977, abandoned. This application Feb. 5, 1979, Ser. No. 9,254
Int. Cl.[3] G11B *17/08*
U.S. Cl. 369—203 **87 Claims**



1. In an automatic record player, the combination of, a main cycling gear, means for rotating said gear one revolution during an automatic cycle, a tone arm mounted for rotation about a fixed point which is spaced from said gear, an elongated link member, means interconnecting one end of said link member with said tone arm at a point offset from said mixed point, said link member having an elongated slot therein, and a pin secured to said gear at a point offset from the center thereof and positioned in said slot, said pin having a cross section such that as said gear rotates said pin becomes wedged against the sides of said slot and connects said gear to said link member as said gear continues to rotate, whereby said tone arm is thereafter driven by said link and rotated about said fixed point.

4,291,887
MODIFIED FACE SEAL FOR POSITIVE FILM STIFFNESS
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Izhak Etsion, Haifa, Israel, and Abraham Lipshitz, University Heights, Ohio
Filed Nov. 7, 1979, Ser. No. 92,145
Int. Cl.[3] F16J *15/34, 15/40*
U.S. Cl. 277—27 **4 Claims**



1. In apparatus for sealing a rotatable shaft extending into a container of fluid of the type having a seat member mounted on said shaft for rotation therewith and an annular seal ring member extending around said shaft in spaced relationship thereto for reciprocating movement toward and away from said seat along the axis of rotation of said shaft with means for biasing said ring member into engagement with said seat wherein said ring member has a substantially circular face directed toward said seat and a substantially cylindrical face spaced from said shaft, the improvement comprising

a circular member rigidly mounted on said ring member in said circular face and having a planar surface extending therefrom toward said seat for sealing engagement therewith by action of said biassing means when said shaft is stationary thereby forming a face seal, said planar surface being moved out of engagement with said seat by a hydrostatic opening force when said shaft is rotating resulting from a flow of said fluid between said shaft and said cylindrical face to said seat, and

a tubular member rigidly mounted on said ring member in said cylindrical face and having a curved surface extending therefrom toward said shaft to form a circumferential clearance seal in series with said face seal to restrict said flow of said fluid to said seat thereby controlling said hydrostatic opening force, the radial width of said planar surface on said circular member being substantially equal to the axial width of said curved surface on said tubular member to provide a predetermined axial stiffness of said face seal so that the spacing between said planar surface and said seat when said shaft is rotating is substantially the same as the spacing between said curved surface and said shaft.

4,291,888
ROTOR SHAFT SEALING MECHANISM IN SYNTHETIC RESIN KNEADING MACHINES OR EXTRUDERS
Takehiko Tanaka, Nishinomiya, and Masahide Kanzawa, Kobe, both of Japan, assignors to Kobe Steel, Limited, Kobe, Japan
Filed Jan. 24, 1980, Ser. No. 115,049
Int. Cl.[3] F16J *9/04, 15/38*
U.S. Cl. 277—65 **3 Claims**

1. A rotor shaft sealing mechanism for a synthetic resin kneading machine, comprising:

a rotor shaft having an end;

a reverse screw means mounted on said rotor shaft end, said reverse screw means including a reverse screw portion of a predetermined length and a second portion;

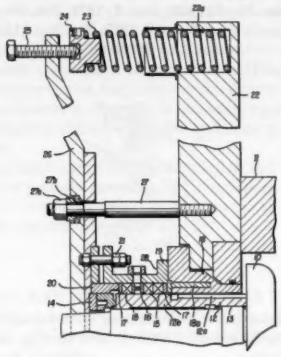
a housing means;

a supporting means securing said housing means around said reverse screw portion;

a gland packing mounted on said second portion of said reverse screw means;

a holder means contacting said gland packing and maintaining said gland packing on said second portion;

a retaining means;



a seal means disposed between said reverse screw means and said retaining means; and

resilient means extending between said supporting means and said retaining means for resiliently connecting said supporting and retaining means, whereby said retaining means resiliently contacts said seal means.

4,291,889

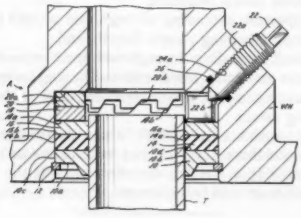
SEAL FOR WELLHEADS

Phillip Hardcastle, Houston, Tex., assignor to Cactus Pipe & Supply Co., Inc., Houston, Tex.

Filed Aug. 18, 1980, Ser. No. 179,021

Int. Cl.³ F16J *15/18*

U.S. Cl. 277—116.4 **2 Claims**



1. An annular seal assembly adapted for use in wellheads to seal between a well conduit and the wellhead, including:

a resilient seal ring adapted to be placed between the outer surface of the well conduit and the inner surface of the wellhead for sealing deformation therebetween to block passage of well fluids;

a follower ring disposed adjacent said resilient seal ring for controlling deformation of said seal ring to effect the desired seal in response to the application of a longitudinal oriented force to said follower;

means operably connected with said packing follower for urging in a longitudinal oriented direction on said packing follower to deform said seal ring, said means for urging including a pair of cooperating actuating rings having means for converting relative rotational movement therebetween to longitudinal expansion of said actuating rings for providing the longitudinal oriented force; and

said actuating rings forming a gapped opening with one of said rings forming a first side of said gapped opening and the other of said actuating rings forming a second side of said gapped opening to produce relative rotational movement between said actuating rings by expanding said gapped opening.

4,291,890

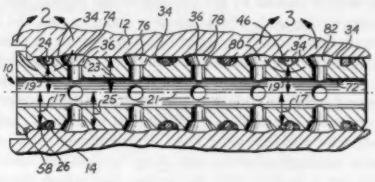
VALVE SEAL WITH O-RING AND BACKUP RING

James V. Walker, Redondo Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 15, 1979, Ser. No. 85,107

Int. Cl.³ F16J *15/18*

U.S. Cl. 277—165 **12 Claims**



1. An improved seal to close the annular space between an inside cylindrical sleeve and a surrounding valve comprising:

a circumferential groove on said sleeve facing outward toward said valve, said groove having two edges perpendicular to said axis of said sleeve, said groove having a flat bottom surface parallel to the axis of the sleeve at its deepest portion and said groove having at least one enlarged conical surface extending from the flat bottom of said groove to an edge of said groove, said conical surface defining a transitional surface between the bottom of said groove and the edge of said groove;

a solid toroidal shaped elastomeric ring mounted on said flat surface of said circumferential groove on said inside cylindrical sleeve, said ring having an inside diameter which requires mounting of said O-ring on the flat bottom surface of said groove, the cross section of said O-ring of sufficient size to be compressed between the flat bottom surface of the groove and the opposing side of the valve;

a solid toroidal shaped backup ring mounted on said conical surface of said circumferential groove on said inside cylindrical sleeve, said ring having an internal diameter permitting mounting said ring on said conical surface of said groove, said backup ring having a cross-sectional area sufficient to prevent the O-ring from being extruded into said annular space when pressure is applied to the seal.

4,291,891

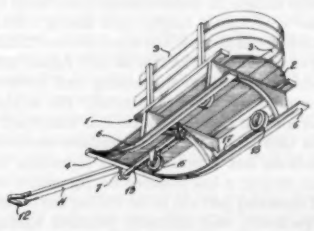
CONVERTIBLE SLED

Claude Blanchette, 6550 Sherbrooke West, Apt. 1808, Montreal, Canada (H4B 1N6)

Filed May 2, 1980, Ser. No. 131,203

Int. Cl.³ B62B *13/18*

U.S. Cl. 280—9 **5 Claims**



1. A convertible sled comprising an elongated seat; two

longitudinally spaced-apart supports rigidly secured to the underside of said seat; a pair of laterally spaced-apart runners rigidly secured in turn to the lower portions of said supports; a plate extending vertically and downwardly from the front of said seat; a first rod extending through and journalled in a hole provided therefor in said plate at its front end and also extending through and journalled in another hole provided therefor in the frontmost support at its rear end; a second and a third rod each rotatably secured at either end to the lower portion of said supports on either side of said sled adjacent said runners, said three rods extending longitudinally of said seat; further comprising a front wheel carried by the said first rod and a pair of rear wheels carried by the corresponding second and third rod respectively; each wheel rotatable about its axis, the latter being transverse to the long axis of the associated rod, a linkage means operatively connecting said first rod to said second and third rods whereby rotation of said first rod causes rotation of said second and third rods through an equal angle; an operating lever integrally attached to the frontmost portion of said first rod; whereby said operating lever can be moved from a first operative position wherein said three wheels are vertically oriented and in contact with the surface over which the sled is travelling, extending slightly below the plane defined by said runners, and a second inoperative position wherein said three wheels are horizontally oriented and retracted upwardly from the plane defined by said runners.

4,291,892

SNOW VEHICLE

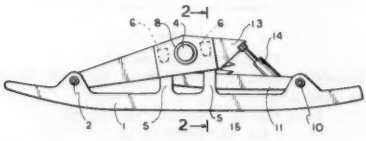
Gert Berthold; Dieter Dreyhaupt; Helmfried Dunse; Erich Henker, and Bernd Viehweg, all of Karl Marx Stadt, German Democratic Rep., assignors to VEB Wissenschaftlich-Technisches Zentrum Automobilbau, Karl Marx Stadt, German Democratic Rep.

Filed Aug. 22, 1979, Ser. No. 68,715

Claims priority, application German Democratic Rep., Sep. 28, 1978, 208102

Int. Cl.³ B62M *27/00*

U.S. Cl. 280—28 **6 Claims**



1. In a snow vehicle, an undercarriage comprising, in combination, a pair of elongated runners each having a leading end portion, a trailing end portion, and a mid-portion therebetween and having an upright part; an arm on each runner and having one end section pivoted to the leading end portion of the runner on a transverse pivot axis, another end section above said mid-portion and having a pocket into which said upright part extends with clearance, an intermediate section between said end sections, and a mounting part depending from said intermediate section; a link member having spaced ends pivoted to said mounting part and to the trailing end section of the runner, respectively; and resiliently yieldable biasing means interposed between and coacting with said link member and said other end section of the arm, respectively.

4,291,893

COUPLING GUARD

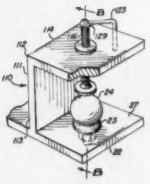
Robert N. Hansen, Avondale, Ariz., assignor to William M. Campbell; Norma J. Campbell; Wesley Bogdan; Robert Clements; William Krone; Keith Krone; Thomas Kovacic; Arloa Stickel and Walter C. Aurea, all of Phoenix, Ariz.

Division of Ser. No. 912,401, Jun. 5, 1978, Pat. No. 4,208,065.

This application Jan. 25, 1980, Ser. No. 115,365

Int. Cl.³ B60D *1/06*

U.S. Cl. 280—507 **5 Claims**



1. A guard for use in combination with a coupling for detachably securing a towed vehicle to a towing vehicle, said coupling including,

an upstanding ball element having a depending attachment shank received through a bore in a mounting member extending rearwardly from said towing vehicle, and

an inverted socket element carried at the free end of a tongue extending forwardly from said towed vehicle,

said socket element being detachably engaged downwardly over said ball element,

and for selectively limiting the upward movement of said socket element relative said ball element, said guard comprising:

a. a base securable to said mounting member and including,

i. a first section upstanding from said mounting member, and

ii. a second section extending from said first section over said ball element and spaced from said ball element to receive said socket element therebetween; and

b. retention means including

i. an aperture extending through said second section and having camming means therein; and

ii. a shaft extending through said aperture and having an upper end and a lower end and having complementary camming means operatively engaged with said camming means

thereby rotation of said shaft in one direction extends the lower end thereof toward said ball element and rotation of said shaft in a counter direction retracts the lower end thereof from said ball element.

4,291,894

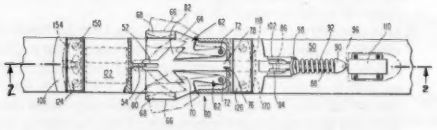
ELECTRICAL SKI BOOT RELEASE

Nicholas F. D'Antonio, 7695 Admiral Dr., Liverpool, N.Y. 13088, and Richard L. Bates, 125 Hillside Way, Camillus, N.Y. 13031

Filed May 7, 1974, Ser. No. 467,821

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—612 **48 Claims**



1. A system for operating ski binding means releasably mounting a ski boot on a ski, said system comprising:

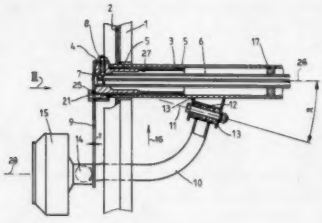
(a) at least one sensing means for sensing at least one type of force between the ski and ski boot in magnitude to the magnitude of at least one of the forces being sensed;
(b) second means electrically connected to said sensing means, said second means receiving and responding to the magnitude and duration of said first electrical signal to produce at least one second electrical signal, said second electrical signal being a function of the magnitude of said forces and of at least one non-instantaneous time characteristic thereof;
(c) third means electrically connected to said second means, said third means being responsive to the signals produced by said second means to produce an actuating signal when said second electrical signal exceeds at least one predetermined value; and
(d) actuating means electrically connected to said third means, said actuating means receiving and responding to said actuating signal to release the ski binding means to allow the ski boot to be separated from the ski.

4,291,895

TORSION-BAR WHEEL SUPPORT FOR TRAILER

Rudolf Wöhrle, Ichenhausen, and Robert Köhler, Kemnat, both of Fed. Rep. of Germany, assignors to Alois Kober KG, Kötz, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 96,224
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851829
Int. Cl.³ B60G *11/18*
U.S. Cl. 280—723 **10 Claims**



1. An assembly for movably supporting a nondriven wheel on a frame of a trailer-type vehicle adapted to travel along the ground in a normal horizontal transport direction, said assembly comprising:

a torsion bar extending horizontally substantially perpendicular to said direction and having an inner bar end anchored to said frame and an outer bar end limitedly elastically pivotal about the bar axis relative to said inner bar end;

an arm extending generally perpendicular to said bar axis and generally in said direction and having an inner arm end fixed to said outer bar end and an outer arm end, said arm being substantially inflexible angularly of said bar axis between said arm ends so that same cannot move angularly relative to each other and being relatively flexible parallel to said bar axis between said arm ends so that same can move relative to each other parallel to said bar axis;

a substantially rigid and inflexible wheel-support strut having an outer strut end connected to said outer arm end and an inner strut end;

bearing means on said frame mounting said strut at said inner strut end for pivoting of said strut about a strut axis skew to said bar axis and passing through said inner strut end, whereby as said strut pivots about said strut axis said bar twists about said bar axis, said outer strut end moves parallel to said axis, and said arm deforms between said outer strut and bar ends with relative displacement parallel to said bar axis of said arm ends; and

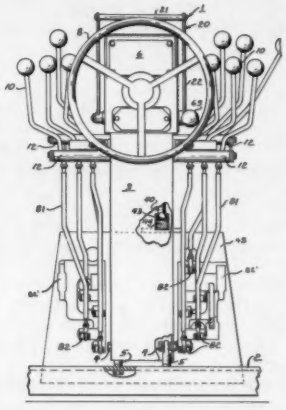
means at said outer strut and arm ends for mounting a wheel for rotation about a wheel axis substantially parallel to said bar axis.

4,291,896

ADJUSTABLE STEERING WHEEL AND CONTROL LEVER CONSOLE

Otto E. Koch, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Nov. 2, 1979, Ser. No. 90,567
Int. Cl.³ B62D *1/18*
U.S. Cl. 280—775 **16 Claims**



1. A steering unit and control lever console for a vehicle comprising

tower means for supporting a vehicle steering wheel unit and at least one vehicle control lever,

bearing means pivotally mounting said tower means in an upward position on a vehicle for movement about a transverse axis to adjust the position of said tower means,

steering wheel housing means selectively retaining the vehicle steering wheel in a fixed position on said tower means,

steering wheel housing means selectively retaining the vehicle steering wheel in a fixed position on said tower means,

said steering wheel housing means including adjustment means to permit selective pivotal movement of said steering wheel housing means relative to said tower means for adjustment of the position of the vehicle steering wheel,

locking means for locking said tower means against pivotal movement upon movement of the tower means to an adjusted position,

release means for disengaging said locking means and pivotally moving said tower means to an adjusted position,

said release means including handle means pivotally mounted on a rotatable shaft and being manually movable in a selected direction for rotating said shaft and moving said tower means to an adjusted position,

said release means further including yoke means operatively coupled to said locking means to disengage said locking means upon rotation of said rotatable shaft by said handle means, and

said yoke means being coupled for rocking movement on said shaft to permit said disengagement of said locking means in either selected direction of movement of said handle means.

4,291,897

UNLOCKING DEVICE FOR SEATBELT SYSTEM

Yoriteru Minami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 15, 1980, Ser. No. 112,176
Claims priority, application Japan, Mar. 9, 1979, 54-30876[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **9 Claims**

1. An unlocking device for a seatbelt system, wherein one end of an occupant restraining webbing is secured to a door of a vehicle so as to fasten the webbing to or unfasten from an occupant in response to opening or closing action of the door, comprising;

(a) a retractor housed in a console box having a webbing takeup shaft for winding said occupant restraining webbing and a ratchet wheel solidly secured to said webbing takeup shaft;

(b) an emergency lock mechanism having a pawl being adapted to be meshed with said ratchet wheel to prevent the webbing windoff rotation of said takeup shaft;

(c) an unlocking knob installed in an opening formed in said console box; and

(d) an unlocking lever pivotally mounted on a frame of said retractor, said unlocking lever rotatably supporting said unlocking knob at one end thereof and rotating along with the unlocking knob to unlock said emergency lock mechanism at the other end thereof when said unlocking knob is turned through more than a predetermined angle in the unlocking direction, whereby as the occupant turns said unlocking knob through more than a predetermined angle in the unlocking direction, said unlocking lever is turned together with said unlocking knob and the other end of said unlocking lever is brought into contact with said pawl to tilt said pawl, so that said pawl is separated from said ratchet wheel and the webbing can be wound off from said takeup shaft of said ratchet wheel.

4,291,898

RESTRAINT BELT POSITIONER

Bernard J. Finn, Troy, and Brian T. Haddlesey, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 17, 1980, Ser. No. 131,063
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—804 **4 Claims**

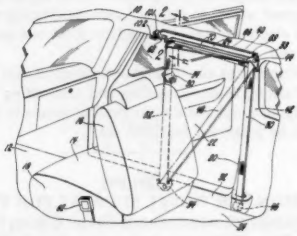
1. In combination with a vehicle body having a door opening defined in part by a roof rail, a seat located laterally adjacent the door opening and having a seat back forwardly pivotal to permit access to the vehicle body compartment rearwardly of the seat back, a restraint belt system comprising:

a restraint belt having one end mounted on the vehicle body generally above and rearward the door opening and another end mounted generally adjacent the occupant hip;

a retracting mechanism provided at one of the belt ends normally maintaining the shoulder belt in a stored position extending across the door opening and partially obstructing access to the compartment behind the seat back and permitting winding and unwinding movement of the shoulder belt to and from an occupant restraining position;

a track extending along the roof rail generally forwardly from the one end of the restraint belt;

a carriage slidably movable along the track and having a belt loop slidably encircling the restraint belt and hand grip means by which the carriage may be manually gripped for foward sliding movement along the track to unwind the restraint belt from the retracting mechanism and dispose



the restraint belt along the roof rail and more generally forward of the door opening to facilitate access to the compartment rearwardly of the seat back;

latch means adapted to latch the carriage at the forward position against rearward movement by the belt winding effort of the retracting mechanism; and

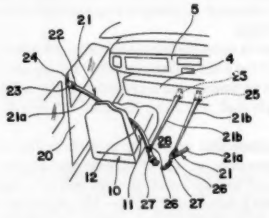
means for selectively releasing the latch means to permit rearward movement of the carriage by the winding effort of retracting mechanism to reestablish the restraint belt in the stored position.

4,291,899

VEHICLE OCCUPANT RESTRAINING SAFETY APPARATUS

Hisao Muramoto, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Nov. 26, 1979, Ser. No. 97,548
Claims priority, application Japan, Nov. 29, 1978, 53-148034
Int. Cl.³ B60R *21/04, 21/10*
U.S. Cl. 280—806 **5 Claims**



1. A vehicle occupant restraining safety apparatus for use in a vehicle having at least one seat assembly installed inside the body of the vehicle, which comprises, in combination:

an elongated and bendable knee protector mounted inside the vehicle body and frontwardly of the seat assembly in face-to-face relationship to the position of the knees of an occupant who may sit on the seat assembly, said knee protector being supported at its opposite end portions on the vehicle body and having an elongated base member and a cushioning means covering at least the surface area of the base member which faces toward the position of the knees of the occupant;

a safety seat belt having first and second opposite ends, said first and second ends of the seat belt being respectively

connected to the knee protector and the vehicle body, the point of connection of the first end of the seat belt to the knee protector being located on one of the opposite sides of the seat assembly and frontwardly of the seat assembly and the point of connection of the second end of the seat belt to the vehicle body being located on the other of said opposite sides of the seat assembly and upwardly and rearwards of the seat assembly;

a guide eye member rigidly connected to the vehicle body at a position on said one of said opposite sides of the seat assembly and downwardly and rearwards of the seat assembly, said seat belt extending loosely through said guide eye member such that a first portion of the seat belt adjacent the first end thereof extends on said one of the opposite sides of the seat assembly between the guide eye member and the knee protector and a second portion of the seat belt adjacent the second end extends diagonally across the back of the seat assembly and frontwardly of the occupant; and

an automatic self-locking retractor connected between one of said first and second ends of the seat belt and the structure to which said one end is connected.

4,291,900

INDEXED BOOK

C. T. Feng, No. 238, Lane 179, Sec. 2, Nei Hu Rd., Hei Hu District, Taipei, Taiwan

Filed Nov. 14, 1979, Ser. No. 93,982

Int. Cl.³ B42D *1/00*; B42F *21/12*

U.S. Cl. 281—15 R **1 Claim**

1. A book having contents arranged in alphabetical order, characterized by that each leaf has two discrete specific zones on the opening margin of one side revealing the first letter of the indexed terms alphabetically arranged in this page, and the second and third letter of the last indexed term in this page; each of said leaves of said book being so structured and said portions being so positioned that both said zones can be seen easily without opening said book.

4,291,901

PRESSURE-SENSITIVE OR HEAT-SENSITIVE RECORDING MATERIAL

Jean C. Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

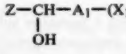
Filed Nov. 16, 1979, Ser. No. 95,119

Claims priority, application Switzerland, Nov. 23, 1978, 12026/78; Oct. 26, 1979, 9628/79

Int. Cl.³ B41M *5/16, 5/18, 5/22*

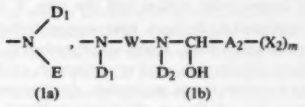
U.S. Cl. 282—27.5 **20 Claims**

1. A pressure-sensitive or heat-sensitive recording material which comprises sheet material coated with a color former and the same or different sheet material coated with a color developer containing at least one compound of the formula



(I)

wherein Z is the radical of a reactive organic methylene or methyl compound or a radical of the formula

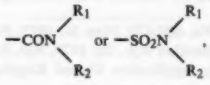


(Ia) (Ib)

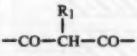
or

(Ic)

wherein each of A_1 and A_2 independently is carbon or unsubstituted or substituted alkylene, arylene or aralkylene, each of X_1 and X_2 is halogen, cyano or nitro, each of D_1, D_2 and E independently is unsubstituted or substituted alkyl, aralkyl, aryl, alkanoyl, alkylsulfonyl, aroyl, arylsulfonyl, cyanoamidino, or is the group



wherein each of R^1 and R^2 independently is hydrogen or unsubstituted or substituted alkyl, aryl or aralkyl, whilst D_1 and D_2 are also hydrogen, or each of the pairs of substituents (R_1 and R_2) and (D_1 and E) together with the nitrogen atom to which said pair is attached is a 5- or 6-membered heterocyclic radical, W is —CO—, —SO_2—, —COCO—,



or unsubstituted or substituted alkylene or phenylene, G is unsubstituted or substituted alkyl, aralkyl or aryl, or is a 5- or 6-membered heterocylic radical, and m is 1 to 6.

4,291,902

RECORDING MATERIAL EMPLOYING SUBSTITUTED 3,6-DIAMINOPHTHALIDES AS COLOR FORMERS

Peter Burri, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

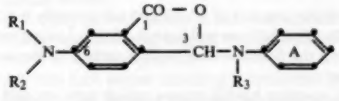
Division of Ser. No. 942,840, Sep. 15, 1978, Pat. No. 4,191,690. This application Sep. 17, 1979, Ser. No. 76,108

Claims priority, application Switzerland, Feb. 10, 1978, 1513/78

Int. Cl.³ B41M *5/16, 5/18, 5/22*

U.S. Cl. 282—27.5 **6 Claims**

1. A pressure-sensitive or heat-sensitive recording material containing a support coated with the color forming 3,6-diaminophthalide of the formula



(I)

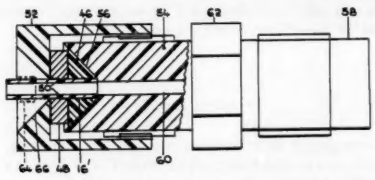
wherein R_1 represents hydrogen, alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents cycloalkyl, benzyl, or benzyl which is substituted by halogen, lower alkyl or lower alkoxy, R_2 represents alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents cycloalkyl, benzyl, or benzyl which is substituted by halogen, lower alkyl or lower alkoxy and R_3 represents alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents cycloalkyl,

phenyl, benzyl, or benzyl which is substituted by halogen, lower alkyl or lower alkoxy, or R_1 and R_2, together with the nitrogen atom to which they are attached, represent a 5- or 6-membered heterocyclic radical and the ring A is unsubstituted or substituted by halogen, nitro, cyano, trifluoromethyl, lower alkyl, lower alkoxy, lower alkoxycarbonyl, aryl, aryloxy, di-(lower alkyl)amino, acyl or acylamino, each acyl containing 1 to 9 carbon atoms, arylamino, diarylamino, N-lower alkyl-N-arylamino, di-(lower alkyl)aminosulfonyl, di-(lower alkyl)aminocarbonyl, arylaminosulfonyl or arylaminocarbonyl, or contains a fused, unsubstituted or substituted benzene or heterocyclic ring.

4,291,903
CONNECTOR FOR TUBING

Robert E. Fields, 51 Norfolk St., Cambridge, England (CB1 2LE)

Division of Ser. No. 800,670, May 26, 1977, Pat. No. 4,165,893. This application Apr. 10, 1979, Ser. No. 28,768
Claims priority, application United Kingdom, Jun. 4, 1976, 23116/76
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—39 **1 Claim**



1. A connector for a tube comprising, in combination:

a first member having an interior wall defining a central aperture through which a tube can be pushed in one direction;

an annular, radially inwardly directed barb-like projection integrally joined to said interior wall defining said aperture which is adapted to bite into the wall of a tube inserted into said aperture to prevent the latter from being pulled therethrough in the opposite direction;

a frusto-conical sealing member having a frusto-conical sealing surface free end face and formed from resiliently deformable plastics material through which the captive protruding end of a tube can pass to terminate flush with the free end face thereof, said first member and said sealing member being in abutment so as to form a subassembly;

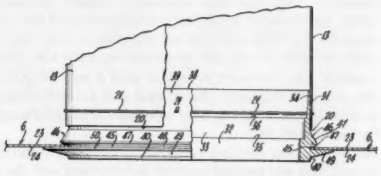
a sleeve within one end of which said subassembly is at least partially fitted said one end having a frusto-conical surface engaging the frusto-conical sealing surface of the sealing member;

a further member having means which acts on said first member and said sleeve for securing said subassembly within said sleeve and for forming a sealed connection between said sleeve, tube and frusto-conical sealing member, said further member having an end with a bore through which a tube may protrude, a screwdriver slot formed in said one end thereof, and a second slot formed in said one end thereof which intersects said screwdriver slot to allow a tube protruding through said end of said further member to be pushed to one side into said second slot to admit the blade of a screwdriver or the like, for turning said further member.

4,291,904
FILTER HOLDER

Niels A. Iversen, Hadsund; Jorgen Pedersen, Mariager, and Hans Lolk, Randers, all of Denmark, assignors to Arkay Packaging Corporation, New York, N.Y.

Continuation of Ser. No. 953,894, Oct. 23, 1978, abandoned. This application Feb. 15, 1980, Ser. No. 121,882
Claims priority, application Denmark, Oct. 24, 1977, 4717/77
Int. Cl.³ F16L *5/02;* **B01D** *46/02*
U.S. Cl. 285—162 **3 Claims**

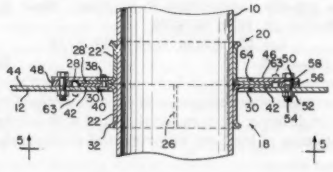


1. An improved holder for use in conjunction with a filter bag, said holder providing for the removable mounting of said bag to a circular opening of a partition plate having plane-parallel opposed surfaces at the mounting opening, said holder being a single ring of flexible material with a skirt portion at one end adapted for circumferential assembly to an open end of the filter bag, said holder having a radially outward circumferential groove near its other end for engaged retention at the mounting opening of the partition plate, said groove having first and second plane parallel opposed sidewall regions and a cylindrical shaped bottom surface between said first and second sidewall regions, wherein the improvement comprises said skirt portion having an outer surface of substantially constant diameter for telescoped reception of the open end of the filter bag along said outer surface for secured assembly thereto, and in which the bottom surface of the groove is of substantially the same diameter as the outer surface of said skirt portion, there being a first retaining rib formation located between said skirt portion and said groove which is formed with said first sidewall region and a second mounting flange rib formation located between said groove and the end of the holder distal to the skirt portion, said second mounting flange rib being formed with the second sidewall region of said groove wherein said second mounting flange rib is a ring-shaped plane radial protrusion having a flat upper surface which is an extension of said second sidewall region, said flat upper surface being adapted to contact one of said plane-parallel opposed surfaces of said partition plate to seal the holder to said plate.

4,291,905
DUCT SEAL

Jesse C. E. Schrock, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1978, Ser. No. 972,535
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—192 **10 Claims**



1. Apparatus for use with a partition subjectable to a transient pressure differential between opposite faces thereof to support an elongated member in position extending through an

opening in the partition with its length generally perpendicular to the faces thereof, said apparatus comprising:

sleeve means for supporting said elongated member, said sleeve means having an interior contour conformable to the external contour of said member, and a flange projectable transversely from the exterior of said sleeve means a distance sufficient to overlap the edge of the opening on one face of said partition, said sleeve means being contactable with said elongated member with sufficient contact pressure to maintain an overpressure seal between said elongated member and said sleeve means, and

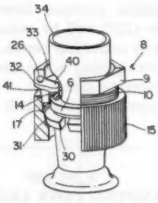
a mounting assembly mountable by the partition adjacent to the opening for supporting said sleeve means such that said flange overlaps the edge of the opening to maintain an overpressure seal between said flange and said partition, said mounting assembly including means for confining and guiding said flange such that said sleeve means may shift conjointly with said elongated member about its longitudinal axis rotatively and orbitally, and permit said elongated member to shift lengthwise with respect to said sleeve means in a direction transverse to the faces of said partition, whereby said overpressure seals allow some leakage of gas from one side of said partition to the other side to slowly equalize pressures on opposite sides of said partition but will prevent an instantaneous pressure equalization.

4,291,906

DEVICE FOR LOCKING AND SEALING STANDARD CONE-SOCKET JOINTS FOR LABORATORY APPARATUS

Martin H. Donbavand, Kantstrasse 133, D-1000 Berlin 12, Fed. Rep. of Germany

Filed Oct. 26, 1979, Ser. No. 86,357
Int. Cl.[3] F16L *49/00*
U.S. Cl. 285—332 **6 Claims**



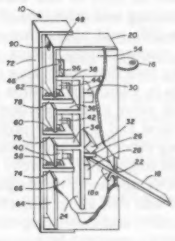
1. In the combination of a cone and socket joint between items of laboratory glassware, which joint comprises a cone portion having a tapered outer wall surface, said cone portion being joined to an adjacent piece of tubing with an annular shoulder formed between said cone portion and said tubing, said cone being fitted within a socket having a tapered inner wall complementary to the taper of the cone and having an external strengthening lip adjacent the mouth of the socket, a line of junction between said cone and socket forming adjacent to said shoulder at the mouth of said socket, with a coupling which coupling comprises: an elastomeric sealing ring for positioning about the annular shoulder; a first annular member for positioning about the cone portion of the joint immediately behind the shoulder and having a male threaded end; a seat in the first annular member engageable with the elastomeric sealing ring to exert an axial load thereon; and a second annular member for positioning about the socket portion of the joint and having a female threaded end which may be screwed onto the male threaded end of the first annular member to hold the cone portion and the socket portion of the joint together and to compress the elastomeric sealing ring into said line of junction between the cone portion and socket portion of the joint to seal said line of junction, said first annular member being constructed and arranged to be held stationary when said second annular member is screwed thereon whereby said sealing ring is subject only to load parallel to its axis of cylindrical symmetry and not to a torsional deforming pressure, the improvement wherein the second annular member has an inwardly directed flange formed with a female frustoconical surface and spaced axially from the female thread, and wherein a radially expansible split ring is positioned within the interior of the second annular member between the female frustoconical surface and the external strengthening lip, said radially expansible split ring having a male frustoconical surface complementary to said female surface of said second annular member, said radially expansible split ring having a radial gap, said gap having a size sufficient to permit the ring to be tightly moved into position behind said external strengthening lip, whereby, when said first and second annular members are screwed together, the axis of the assembled coupling is aligned with the axis of the cone and socket joint and the radially expansible split ring is urged radially inwards behind the socket portion of the joint.

4,291,907

DROP LATCH

Dale F. Berger, 14235 Julie Dr., Humble, Tex. 77338

Filed Apr. 2, 1979, Ser. No. 26,287
Int. Cl.[3] E05C *1/16*
U.S. Cl. 292—188 **7 Claims**



1. A drop latch assembly, comprising in combination:

a housing;

a vertical bolt located within said housing and guided for movement therein between first and second positions, said bolt normally being located in the first position;

a lever extending through a passage in said housing to engage said bolt, said lever being selectively operable to elevate said bolt to the second position;

at least one arm joined transversely to said bolt within said housing, said arm having a depending striker mounted normal thereto;

said housing having therein a slot corresponding to each striker, said slot being aligned with said striker when said bolt is in said first position;

key driven lock means including a horizontal jam unit disposed in said housing for horizontal movement into the path of said bolt to block said path for releasably locking said bolt in the first position;

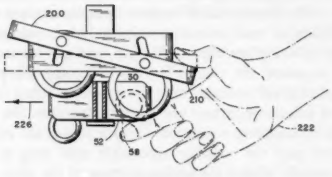
a latch plate having a horizontal latch loop corresponding to each slot in said housing, said latch loop being adapted to enter said housing slot and engage said striker such that said latch plate and housing are lockingly interconnected; and

the contacting surfaces of the striker of said bolt and the latch loop of said latch plate being configured such that said bolt is momentarily cammed out of the first position before the striker seats within the latch loop.

4,291,908
SAFETY GATE LATCH SYSTEM

Marvin W. Gittins, Sr., 3601 Twin City Dr., Council Bluffs, Iowa 51501

Filed Jul. 24, 1980, Ser. No. 171,898
Int. Cl.[3] E05C *19/04*
U.S. Cl. 292—299 2 Claims

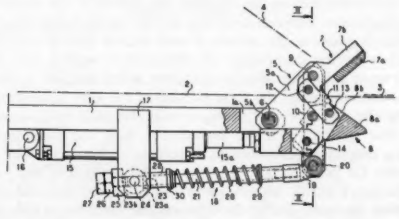


1. A safety gate latch system (10) comprising: an upper gate latch assembly (20) comprising a gate tongue (30) adapted to be attached to the free end of a gate latching portion (31), said tongue (30) swinging in a circular arc (50) in a horizontal plane and extending substantially radially with respect to said arc, an upper gate tongue securing assembly (60) comprising a first upper ring (64), said tongue (30) being disposed on a certain side (65) of said first upper ring (64) when said gate latch is in a gate-closed position, said first upper ring (64) having first and second opposite sides (66,68) lying in substantially vertical parallel planes each substantially tangent to said swinging arc, an upper ring-receiving frame means (80) having portions (82,84) disposed one on each of said sides of said first upper ring (64) for maintaining said sides (68) of said first upper ring (64) in said planes (90), said upper ring-receiving frame (80) having an upper ring-receiving recess means (96) therein moveably receiving said first upper ring (64), when said gate latch system (10) is in a latching position said first upper ring (64) having a lower outer surface portion (102) inclined with respect to the vertical and normally projecting downwardly from said upper ring-receiving frame means (80) in the path of the swinging of said tongue (30) whereby said first upper ring (64) is caused to move upwardly by the passing of said tongue under the center of said first upper ring (64), a first upper ring retainer (82) attached to said upper ring-receiving frame means (80) and extending approximately horizontally through the center opening (94) of said first upper ring (64) in a position such that when an upper portion of said first upper ring (64) engages said first upper ring retainer (82) the lower side of said first ring will be disposed below the upper surface (33) of the latching portion (31) of said tongue (30), a first upper ring-hold means (86) fixed to said upper ring-receiving frame means (80) and disposed on an opposite side of said first upper ring (64) from said certain side (65), said first upper ring holding means (86) having a lower surface disposed in a position for engaging said outer surface portion (102) of said first upper ring (64) at a time when said first upper ring (64 is in a gate-locking position, and said first upper ring retainer (82) engaging a wall of said central opening (96) of said first upper ring (64) when said latch is in a gate-latching position whereby when said gate latch is in a gate-holding position said tongue (30) is prevented from moving horizontally in a direction generally toward said first upper ring (64) to prevent said gate from accidentally opening in the respective direction, a second and similar gate latch assembly (50) for safety having like parts and comprising a lower ring-receiving frame means (52) fixed to said gate tongue (30), said lower ring-receiving frame means (52) having a lower ring-receiving recess means (56), a primary lower safety ring (58) mounted in said lower ring-receiving frame means (52) similarly to the way said first ring (64) is mounted in said upper frame (80), a post-tongue (72) for attachment to a gate post (110) and extending when said system is in a gate-latched position across the pathway of said primary lower safety ring (58), said second gate latch assembly having a primary lower safety ring retainer (74) and a primary lower safety ring-holding means (76) having the same relationships to said lower frame means (52) and to said primary lower ring (58) as said first upper ring retainer (82) and said first upper ring-holding means (86) have to said upper frame (80) and to said first upper ring (64), a second upper ring (150) substantially similar to said frist upper ring (64), said second upper ring (150) being disposing in said first recess means (96) of said upper frame means (80) and arranged substantially parallel to and spaced from said first upper ring (64) and horizontally spaced from said first upper ring (64) whereby in gate-closed position said gate tongue is in a space (170) between said first and second upper rings (64,150), a second upper upper ring retainer (154) attached to said upper ring-receiving frame means (80) and having a similar relationship to said second upper ring (150) and to said upper ring-receiving frame means (80) to that which said first upper ring retainer (82) has to said first upper ring (64) and to said first upper frame means (80), a secondary lower safety ring (160) substantially similar to said primary lower safety ring (58), said secondary lower safety ring (160) being disposed in said lower second ring-receiving recess means (56) and being arranged substantially parallel to and spaced from said primary lower safety ring (58) whereby in a gate-closed position said post-tongue (72) is disposed between said primary and secondary lower safety rings (50,160), a secondary lower ring retainer (200) attached to said lower ring-receiving frame means (52) and having a similar relationship to said secondary lower ring (160) and to said lower frame means (52) to that which said primary lower ring retainer (74) has to said primary lower ring (58) and to said lower frame means (52), a ring-releasing assembly means (200) having finger-engageable portions (210) on each side of said space (170) between said first and second upper rings (64,150), said finger-engageable portions (210) being operatively correlated with said first and second upper ring retainers (82,154) so that when one of said finger-engageable portions (210) is moved then that certain one of said first and second upper ring retainers (82,154) which is located on the opposite side of said space (170) between said first and second rings (64,150) of said one of said finger-engageable portions from said moved finger-engageable portion (210) will be raised so as to permit said tongue (30) to pass by under said certain one of said ring retainers (82,154) for gate opening when simultaneously the lower safety ring (58,160) on the same side of said space (170) as said moved finger-engageable portion (210) is raised to release said post tongue 72.

4,291,909
CLAMPING JAWS ASSEMBLY

Alain Coatantiec, Bruz, France, assignor to Société Anonyme Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed May 1, 1980, Ser. No. 145,484
Claims priority, application France, May 22, 1979, 79 13910
Int. Cl.[3] B25J *15/00;* B66C *1/42*
U.S. Cl. 294—88 5 Claims



1. In a clamp assembly
an elongate arm,
a clamp body pivoted to the arm at one end of the latter, said body carrying

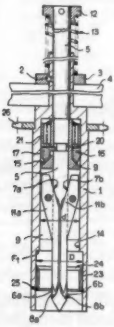
two pivotal jaws and
rod means pivotally interconnecting the jaws and serving to limit opening movement of the jaws,
double-acting actuator means interconnecting one of the jaws and the arm, and
a telescopic, spring-loaded, device interconnecting the said clamp body and the arm,
said actuator means and the telescopic, spring-loaded, device being operative to control opening and closing of the jaws and to pivot the body as a whole.

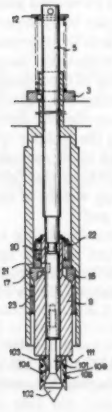
4,291,910

DISAPPEARING GRASPING HEAD

Jacques Maupate, Givry, France, assignor to Societe Generale Pour l'Emballage, France

Filed Dec. 21, 1979, Ser. No. 106,038
Claims priority, application France, Dec. 22, 1978, 78 36190
Int. Cl.[3] B66C *1/54*
U.S. Cl. 294—95 **32 Claims**





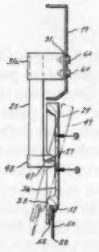
1. A device for grasping hollow bodies comprising:
a housing,
a mechanism capable of movement into said housing and out of said housing, said mechanism further comprising means for contacting said hollow body and grasping means capable of acting on an interior wall of said hollow body,
means for limiting the extent of the outward movement of said mechanism,
means which actuate the grasping means to secure said mechanism to said hollow body and to prevent said mechanism from returning into said housing when said mechanism contacts said hollow body on an outward movement before reaching the full extent of such movement as determined by said limiting means, and
means which return said mechanism into said housing if said mechanism is moved outward beyond the point at which said grasping means can be actuated when said mechanism contacts said hollow body.

4,291,911

AIR DAM APPARATUS FOR A MOTOR VEHICLE

William W. Gallmeyer, 513 Krause St., Ann Arbor, Mich. 48103

Filed Feb. 6, 1980, Ser. No. 119,168
Int. Cl.[3] B62D *37/00*
U.S. Cl. 296—78 R **12 Claims**

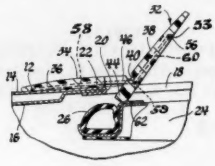


1. Air dam apparatus for a motor vehicle having a frontal clearance area defined by space beneath said vehicle extending to ground level, said apparatus comprising a door-like air deflection panel member dimensioned for substantially blocking said frontal area by deflection of air therefrom upon forward movement of said vehicle, strut means adapted for being attached to said vehicle for extending below said vehicle at the front thereof, pivot means hingedly securing said panel member to said strut means with said panel extending transversely across said frontal clearance area and for permitting the lower edge of said panel to be closely proximate ground level, said pivot means defining a transverse pivot axis about which said panel may rock, said pivot axis being vertically positioned with respect to said panel for providing substantial balancing of aerodynamic forces upon said panel above and below said pivot axis during forward movement of said vehicle, means resiliently urging said panel with respect to said pivot axis toward a position for blocking said frontal area but permitting rocking about said pivot axis in response to an obstruction contacting said panel below said pivot axis, said pivot axis being positioned relative to the body of said panel member so as to provide an upper portion of said panel member above said pivot axis and a lower portion of said panel member below said pivot axis, and upper portion advancing forward of said pivot axis and said lower portion retreating behind said pivot axis upon rocking of said panel member in response to said panel member being contacted by an obstacle, first and second wing members for deflecting air outwardly on opposite sides of said vehicle, and wing securement means adapted for being attached to said vehicle for mounting said wing panels on respective opposite sides of said panel member, said wing members each comprising an auxiliary panel positioned in front of a respective one of said wheels and extending from said vehicle to closely proximate ground level, said panel member and auxiliary panels together presenting, when said panel is in said blocking position, a substantially continuous air dam surface across the front of said vehicle therebelow, said wing members each being detachably interengaged with said vehicle for being pulled out of engagement upon extraordinary force downwardly away from said vehicle.

4,291,912
WIND DEFLECTOR FOR SUN ROOF

Robert M. Fox, Dryden; Robert D. Mogk, Holly, and Edward T. Priebe, Mount Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 28, 1980, Ser. No. 144,400
Int. Cl.[3] B60J 7/22
U.S. Cl. 296—217 2 Claims



1. A wind deflector for a vehicle body having a roof panel defining a roof opening, a closure panel adapted to close the roof opening, and means for moving the closure panel between a rearward and lowered open position and a forward and raised closed position, said wind deflector comprising:

a deflector mounting body adapted for overlying attachment on the roof panel forward of the roof opening and extending rearwardly above the roof opening, a deflecting vane adapted to overlie the roof opening, hinge means joining the mounting body and the deflecting vane and defining a hinge axis extending transversely of the vehicle body above the roof opening to permit movement of the deflecting vane between a stowed position in parallel overlying relationship with the closure panel and an angularly raised position adapted to dispose the deflecting vane in wind-deflecting attitude above the roof opening, spring means situated wholly above the roof panel and acting between the mounting body and the deflecting vane and adapted to urge the deflecting vane to the angularly raised wind-deflecting attitude, and an operating leg portion associated with the deflecting vane and extending forwardly across the hinge axis so that the operating leg portion extend downwardly into the roof opening for engagement by the closure panel when the deflecting vane is disposed in the angularly raised position by the spring means, whereby the wind deflecting vane is automatically lowered against the bias of the spring to the normal stowed position by engagement of the closure panel with the operating leg portion upon closing movement of the closure panel and raised to the deflecting attitude by the spring means upon opening movement of the closure panel moving the closure panel out of engagement with the operating leg portion.

4,291,913
MANUALLY-OPERATED RECLINING CHAIRS

Jerome R. Kowalski, Amsterdam, N.Y., assignor to Mohasco, Corp., Amsterdam, N.Y.

Filed Oct. 9, 1979, Ser. No. 82,810
Int. Cl.[3] A47C 1/023, 1/037
U.S. Cl. 297—89 22 Claims

1. In a reclining chair of the type having

(A) a stationary base for supporting the chair on a floor;

(B) body-supporting means including a seat located generally above the base, and a backrest located rearwardly of the seat;

(C) an armrest located at a side of the seat;

(D) a recliner system at the armrest, and kinematically interconnecting the body-supporting means to the base for reciprocal movement of the body-supporting means relative to the base in forward and rearward directions along a path which extends between

an end-limiting upright chair position in which the body-supporting means is oriented at a predetermined orientation relative to the base, and

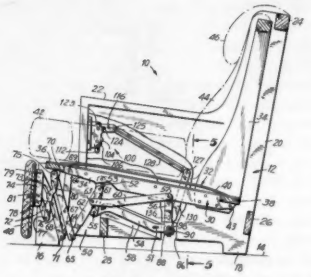
an end-limiting fully-reclined chair position in which the body-supporting means is oriented at a different reclined orientation relative to the base;

the improvement which comprises:

(a) manually-actuatable means for driving the recliner system and for moving the body-supporting means along the path only in the forward direction from the upright chair position towards an intermediate chair position which is intermediate the end-limiting chair positions,

(b) said manually-actuatable means including an actuator member mounted on the armrest within hand-reach of a seated user, for displacement along a working stroke from a first position which corresponds to the upright chair position, to a second position which corresponds to the intermediate chair position,

(c) said manually-actuatable means being in force-transmitting relationship with, and affirmatively forwardly driving, the recliner system throughout the displacement of the actuator member as it is being displaced from its first position towards its second position, and for thereby forwardly moving the body-supporting means downstream of the path towards the intermediate chair position,



(d) said manually-actuatable means being in impositive engagement, and out of force-transmitting relationship with, the recliner system when the actuator member reaches the second position, to thereby disengage the manually-actuatable means from the recliner system and permit the body-supporting means to be moved forwardly further downstream of the path to the fully-reclined position in response to the body weight of the seated user acting on the recliner system, and

(e) said actuator member being returnable from its second position to its first position upon disengagement of the manually-actuatable means from the recliner system when the actuator member reaches its second position.

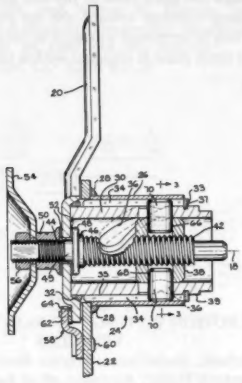
4,291,914
ADJUSTABLE SEAT HINGE

Ned W. Mizelle, Lexington, Ky., assignor to Hoover Universal, Inc., Saline, Mich.

Filed Jan. 10, 1980, Ser. No. 110,814
Int. Cl.[3] A47C 1/024
U.S. Cl. 297—361 13 Claims

1. An adjustable hinge comprising a pair of elements, means pivotally connecting said elements for relative pivoting to a plurality of adjusted positions, said pivotal connecting means comprising a first member connected to one of said elements and a second member connected to the other of said elements, said first and second members being substantially coaxial and relatively rotatable about a pivot axis, means forming cam opening means in said one member defining a first path spaced from said pivot axis, means forming control opening means in said second member defining a second path spaced from said

pivot axis different from said first path, a slider member mounted for movement axially of said first and second members, said slider member having projecting means extending into said cam opening means and into said control opening



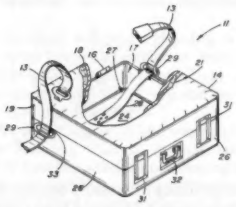
means, said projecting means being movable through said cam and control opening means in response to movement of said slider member axially of said first and second members to cause relative rotation between said first and second members to pivot said elements to said adjusted positions.

4,291,915

COMBINED SUITCASE AND CHILD'S SAFETY SEAT

Jeanette Cox, 5548 Poplar Blvd., North Highlands, Calif. 95660

Filed Apr. 26, 1979, Ser. No. 33,445
Int. Cl.³ B60R *21/10*; A47C *7/62*; A45F *4/00*
U.S. Cl. 297—193 **7 Claims**



1. A combined suitcase and child's safety seat for use with a conventional vehicle seat belt comprising:

a. a receptacle having a bottom and a vertically spaced top substantially parallel to said bottom, vertical side walls and end walls being interposed between and interconnecting the periphery of said bottom and said top, said side walls and end walls being disjoined through a plane substantially parallel to said top and spaced substantially equidistant from said top and said bottom to form an upper portion and a lower portion, said upper and lower portions being hingeably connected on one side so as to permit opening and closure of said receptacle, and latching means to secure together said upper and lower portions of said receptacle;

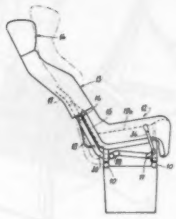
b. a safety strap comprising an elongated, flexible strip including a loop at each end thereof, said strip being extended and inserted between said upper and lower portions of said receptacle prior to closure said strip being of sufficient length so that said loops are located outside the opposite end walls of said receptacle to receive the respective free ends of the seat belt when said receptacle is closed, said loops securing said receptacle to said seat belt as said seat belt is extended over the child's lap and buckled.

4,291,916

SEAT FOR BUS, TRAIN OR AIRPLANE

Max M. F. Chardon, Saint-Prim, France

Continuation of Ser. No. 28,816, Apr. 10, 1979, abandoned. This application Aug. 20, 1980, Ser. No. 179,827
Claims priority, application France, Nov. 13, 1978, 78 32693
Int. Cl.³ A47C *1/025*
U.S. Cl. 297—367 **7 Claims**



1. A seat comprising:

a seat frame having a rearward and upward extension having an upper end defining a horizontal pivot axis;

a generally horizontal seat part supported on said seat frame and lying wholly below said axis and a rear edge;

a back frame pivoted on said seat frame at said axis and having a downward extension projecting downwardly below said axis and having a lower end underneath said seat part;

an upright back part having an upright lower back cushion supported on said extension of said seat frame below said axis and an upright upper back cushion supported on said back frame above said axis, said cushions defining a front surface lying at its rearmost point behind said pivot axis; and

means underneath said seat part and engaged between said lower end of said back frame and said seat frame for locking said back part with said upper cushion in any of a plurality of angularly offset positions about said axis relative to said seat part and said lower cushion.

4,291,917

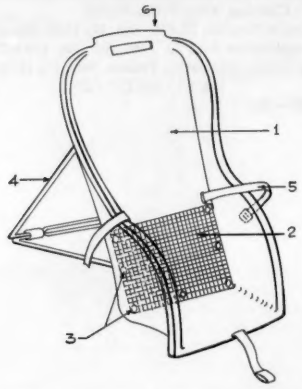
LOW PRESSURE INFANT SEAT FOR NORMALLY SEATING INFANTS WITH MENINGOMYELOCELE OR OTHER SENSITIVE BACK DEFORMITIES

Gail B. Hawks, 4615A Walden Pond Dr., Raleigh, N.C. 27604

Filed Sep. 19, 1979, Ser. No. 77,117
Int. Cl.³ A47D *13/02*
U.S. Cl. 297—452 **4 Claims**

1. A low pressure infant seat for normally seating infants with meningocele/meningomyelocele or other sensitive back deformities comprising a device molded so as to form a seat having a seat portion with a back portion extending from the rear of the seat portion beyond the head area for the purpose of support, said device having an open area provided in the lower portion of the back of the said device beginning at the base of the back portion in the vicinity of the juncture of said back portion with the rear of the said seat portion and extending up the back portion a sufficient distance to prevent a pressure to the meningocele/meningomyelocele or the surrounding area; a detachable mesh insert applied over the said open area in the said lower portion of the back of the said device; means which allow for attaching and detaching the said mesh insert to the said device, said means so positioned so that no pressure points are formed at or near the spinal area at the upper edge of the said mesh; an adjustable bracing device attached to the back of

the said device; safety straps for maintaining an infant in position in the device; wherein said device has side portions extending forwardly, wherein said detachable mesh insert includes a generally rectangular portion of resilient material stretched across the said open area, wherein said means which allow for attaching and detaching said mesh insert are detachable fasteners connected to the back portion and mesh insert and are positioned around the open area, wherein said bracing device extends from four points on the dorsal side of the said device to allow for adjustment of position of said device, and wherein said safety straps are attached laterally and proximate to the said device.



4,291,918

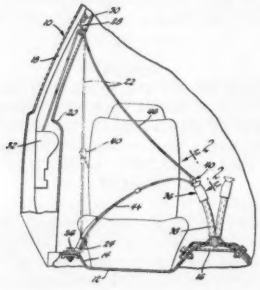
BUCKLE ASSEMBLY FOR CONTINUOUS LOOP OCCUPANT RESTRAINT BELT SYSTEM

Bernard J. Finn, Troy; Brian T. Haddlesey, Sterling Heights, and Kenneth H. Reid, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 19, 1979, Ser. No. 77,009

Int. Cl.³ B60R *21/00*; A62B *35/00*

U.S. Cl. 297—483 **2 Claims**



1. In combination, a single loop continuous restraint belt, a latch plate slidably movable along the restraint belt to divide the restraint belt into variable length shoulder belt and lap belt portions, a buckle having a frame and means adapted for latching engagement with the latch plate to establish the lap and shoulder belt portions in their respective restraining positions across a seated occupant, a cinching member pivotally mounted on the latch plate and having the restraint belt passing therearound so that sliding movement of the belt through the latch plate in either direction induces pivotal movement of the cinching member in a corresponding direction of rotation, and a lip member integral with the frame of the buckle and projecting into proximity with the restraint belt generally along one side of the cinching member and adapted to provide an abutment surface against which the cinching member clamps the restraint belt upon attempted sliding movement of the restraint belt through the latch plate in the one direction which pivots the cinching member toward the lip member whereby the restraint belt is permitted to travel in only the other direction when the latch plate is engaged within the buckle.

4,291,919

DEFLECTION FITTING FOR SAFETY BELTS FOR VEHICLES

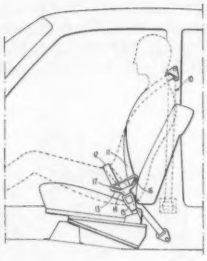
Walter Schmid, Sindelfingen; Werner Breitschwerdt, Stuttgart, and Guntram Huber, Aidlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 9, 1979, Ser. No. 93,032

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1978, 2849905

Int. Cl.³ B60R *21/10*

U.S. Cl. 297—483 **24 Claims**

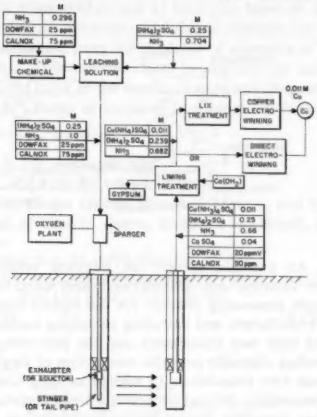


1. A deflection fitting for a safety belt for vehicles, the safety belt including a chest belt and a lower belt, the deflection fitting comprising a first belt guidance means for guiding a belt band section of one of the chest and the lower belt, a second belt guidance means for guiding a belt band section of the other of the chest and the lower belt, and a lock tongue means spaced from the first and second belt guidance means, the lock tongue means being adapted to be inserted into and locked in a belt lock means, characterized in that each of the belt guidance means are formed as an elongated slot, the second belt guidance means is independent of and spaced from the first belt guidance means, the first and second belt guidance means are arranged laterally of and at a transverse distance from a longitudinal center axis of the locked tongue means extending in an insertion direction thereof into the belt lock means, the first belt guidance means extends on one side of the longitudinal center axis of the lock tongue means and the second belt guidance means on the other side thereof, and in that each of the first and second belt guidance means are inclined with respect to and spaced from the center longitudinal axis of the lock tongue means and are inclined with respect to one another in such a manner that the chest belt and the lower belt assume a most favorable position on a user of the safety belt when the lock tongue means is locked in the belt lock means.

4,291,920
IN SITU EXPLOITATION OF DEEP SET PORPHYRY ORES

Peter J. Lingane, Ponca City, Okla.; Michael J. Redman, Belmont, Mass.; Won C. Park, Irvine; Robert A. Hard, Laguna Beach, both of Calif., and Walter W. Harvey, Arlington, Mass., assignors to Kennecott Corporation, Stamford, Conn.

Filed Apr. 30, 1980, Ser. No. 145,379
Int. Cl.³ E21B *43/28*
U.S. Cl. 299—4 **6 Claims**



1. A process for the in situ exploitation of a deep set, porphyry ore deposit of the type characterized by a multiplicity of naturally occurring microscopic fracture openings and containing a metal value selected from the group of sulfidic copper, nickel, cobalt, molybdenum, uranium and mixtures thereof and metals by ion exchange, said process comprising the steps of:

A. providing an injection well and a plurality of production wells spaced apart from the injection well, said wells being in communication with said prophyry ore deposit, the volume between the injection well and the production wells defining leaching interval;

B. stimulating the permeability of the leaching interval by contacting the leaching interval through said injection well with a first aqueous solution comprising ammonia, a calcium sulfate scale inhibitor and an effective amount of nitrate or chloride salt of a cation selected from the group consisting of Na^+, K^+, NH^+_4 and mixtures thereof to replace exchangeable calcium ions, to induce clay concentration, and to solubilize calcium ions;

C. priming the leaching interval by displacing the calcium ion containing solution in the leaching interval with a second aqueous solution containing an ammonium salt, a calcium sulfate scale inhibitor, and oxygen containing gas, the ammonium ion content of the second solution being effective to suppress the uptake on the ion exchange minerals of copper and/or nickel released on oxidation of the sulfidic copper and/or nickel minerals by oxygen;

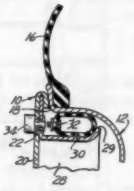
D. recovering copper and/or nickel by injecting a two-phase lixiviant into the leaching interval, said lixiviant comprising a multiplicity of entrained oxygen containing gas bubbles and an aqueous solution containing scale inhibitor having a pH less than 10.2, containing ammonium ions and containing no greater than about 1.0 mole/-liter ammonia, collecting a copper and/or nickel bearing ammoniacal leach liquor from a production well, winning copper and/or nickel from the recovered leach liquor, adding oxygen and make up chemicals to the copper and/or nickel depleted liquor, and recirculating the resulting lixiviant; and

E. displacing the solutions in the leaching interval by injecting a filler solution into the leaching interval and collecting a copper and/or nickel bearing ammoniacal liquor from a production well.

4,291,921
HUB CAP FOR VEHICLE WHEELS

Hurst E. Wulf, 625 Middlesex Blvd., Grosse Pointe Park, Mich. 48230

Filed Jul. 2, 1979, Ser. No. 53,902
Int. Cl.³ B60B *7/06*
U.S. Cl. 301—37 AT **17 Claims**



8. A pneumatic tube assembly unit for use with vehicle hub caps having a disk with an inwardly disposed circular array of resilient members for gripping the vehicle wheel, such unit comprising an inflatable tube for flexing the resilient members, valve means on the inflatable tube for controlling the pressure therein, a non-flexible ring around the inner periphery of the inflatable tube and means holding the non-flexible ring on the inflatable tube.

15. A hub cap for a vehicle wheel having an inwardly disposed annular surface, such hub cap comprising a disc having therein an access opening, means for locking said disc to said vehicle wheel comprising an outstanding circular collar on the inner surface of the disc, an inflatable tube portion supported on the outstanding circular collar, a valve stem assembly on the inflatable tube portion aligned with the access opening in the disc for pressurizing the inflatable tube portion so as to bring it into a holding engagement with the inwardly disposed annular surface on the vehicle wheel, and means for lockably closing said access opening whereby deflation of said tube portion is required to remove said hub cap from said vehicle wheel.

4,291,922
ANTI-SKID MECHANISM FOR WHEELED VEHICLE

Ewald Dolibois, deceased, late of Farmington Hills, Mich., and Rose V. Dolibois, administratrix, 28369 Bay Tree Dr., Farmington Hills, Mich. 48018, assignors to Rose Dolibois, Farmington Hills, Mich.

Filed Dec. 20, 1979, Ser. No. 105,720
Int. Cl.³ B60B *15/00*
U.S. Cl. 301—46 **6 Claims**

1. An anti-skid device for a wheeled vehicle comprising the combination of:

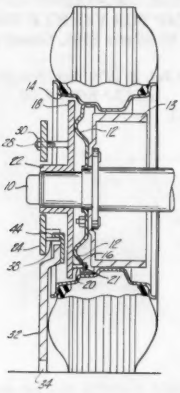
A. a flanged disk adapted to be mounted on the outer side of the wheel of at least two wheels of said vehicle;

B. an annular plate slideably mounted on the flange of said flanged disk, said plate being mounted for limited angular and limited axial movement relative to said flanged disk;

C. a plurality of radially moveable arcuate ground-engageable shoes independently and slideably mounted between the planar surfaces of said flanged disk and said plate and wherein said shoes have at least two spaced parallel tracks formed thereon, said tracks being parallel to a radius extending through a centrally located cam follower on said shoes and said flanged disk has abutment means arranged for engagement with said tracks;

D. cam means on said plate operatively engageable with said

centrally located cam follower on said shoes for imparting radial movement to said shoes upon rotation of said plate relative to said flanged disk; and



E. abutment means for moving said plate towards said flanged disk and for clamping said shoes therebetween thereby preventing rotational movement of said shoes relative to said flanged disk and said plate.

4,291,923

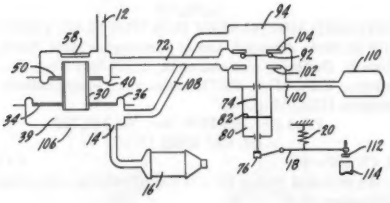
EMPTY AND LOAD BRAKE DEVICE

Henry R. Billeter, Marco Island, Fla., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Mar. 3, 1980, Ser. No. 126,843

Int. Cl.³ B60T 8/20

U.S. Cl. 303—23 R **17 Claims**



1. An empty and load device for a railroad vehicle air brake system for controlling brake application pressure comprising,

housing means having an inlet connected to a pressure source and an outlet connected to an air brake cylinder, a first passage between said inlet and outlet, valve means controlling communication through said first passage, pressure proportional piston means controlling opening and closing of said valve means,

a second passage between said inlet and outlet, second valve means controlling communication through said second passage, and a load sensing arm movably attached to said housing means for controlling operation of said second valve means.

4,291,924

ANTI-SKID CONTROL SYSTEM FOR MOTOR VEHICLES

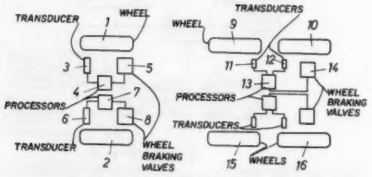
Heinz Leiber, Leimen, and Jürgen Gerstenmaier, Neckargemünd, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,753

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2811999

Int. Cl.³ B60T 8/02

U.S. Cl. 303—111 **9 Claims**



1. An anti-skid system for wheeled vehicles, especially motor vehicles, with at least two wheel speed transducers and a single processing channel for the signals from said at least two transducers, and including switching means connected to the at least two transducers and the processing channel, for providing alternate periodic connection of single ones of said at least two transducers to said processing channel, wherein the processing channel generates a brake command signal, and further including circuit means connected to the switching means for altering the rhythm of connection of said transducers, and wherein the improvement comprises: said at least two transducers being disposed to sense the speed of at least two wheels which are mounted on the same side of the vehicle, and a common brake pressure device which is connected to the processing channel to receive the brake command signal and is further connected to the at least two wheels such that the common brake pressure device jointly engages the at least two wheels.

4,291,925

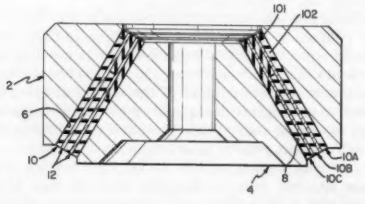
LAMINATED BEARINGS WITH DUAL STOCK LAYERS

Robert R. Peterson, Hudson, and Daniel S. Ventura, Malden, both of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Jul. 26, 1979, Ser. No. 61,009

Int. Cl.³ F16C 27/08

U.S. Cl. 308—26 **6 Claims**



1. In a laminated bearing comprising a plurality of alternating and bonded together layers of elastomeric and substantially non-extensible material with the layers disposed about a common axis so as to permit the bearing to support compressional loads applied generally normal to said layers and torsional loads applied about said axis, each layer having with respect to said axis a radially inner circumference and a radially outer circumference, the improvement wherein at least one of said elastomeric layers consists of a first portion thereof positioned

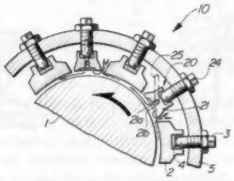
at said outer circumference having a pre-selected first nominal modulus of elasticity which exhibits relatively small changes in modulus over a relatively wide range of strain magnitudes and a second portion positioned at said inner circumference having a pre-selected second nominal modulus of elasticity which exhibits substantially larger changes of modulus over at least a portion of said range of strain magnitudes, whereby compression-induced shear strain distribution within said at least one layer is improved by said positioning of said portions, and wherein said two portions are effectively proportioned in size relative to each other within said at least one layer so as to achieve a pre-selected composite modulus of elasticity for said layer which is different from the modulus of elasticity of any other elastomeric layer and calculated to improve the uniformity from layer to layer of the bearing's torsional shear strain distribution over a range of torsional load input conditions.

4,291,926

GUIDE BEARING DEVICE

Shunzo Tomioka; Kinpei Okano; Masanori Matsuo, and Yosio Furukawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1979, Ser. No. 77,836
Claims priority, application Japan, Sep. 22, 1978, 53-115926
Int. Cl.³ F16C *17/03, 33/02*
U.S. Cl. 308—73 **6 Claims**



1. A guide bearing device comprising;
a plurality of first segmental pads disposed circumferentially equidistantly around a rotary shaft;
means for supporting each of said first segmental pads for pivotal movement; and
a housing mounting therein said first segmental pads and said supporting means and containing lubricating oil; wherein the improvement comprises a plurality of second segmental pads each interposed between the first respective segmental pads and formed with an oil passage, said oil passage being connected to a pressurized oil supply source and feeding the lubricating oil to a sliding surface of each of said first segmental pads wherein each of said segmental pads is pivotally mounted within said housing.

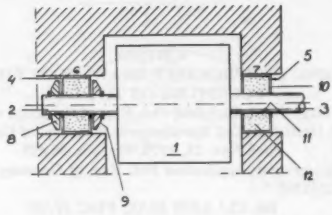
4,291,927

INTEGRAL FOAMED PLASTIC SLIDING BEARINGS

Stig Persson, Katrineholm, Sweden, assignor to SKF Industries, Inc., King of Prussia, Pa.

Continuation-in-part of Ser. No. 811,966, Jun. 30, 1977, abandoned. This application Mar. 2, 1979, Ser. No. 16,977
Claims priority, application Sweden, Oct. 18, 1976, 7611518
Int. Cl.³ F16C *33/66*
U.S. Cl. 308—121 **3 Claims**

1. A linear sliding bearing supporting a carriage for longitudinal movement relative to a guide with a groove, said sliding bearing comprising a pair of elongated rod members, each rod member made of a foamed plastic material consisting of at least one homogeneous liquid impermeable hard and rigid peripheral surface shell portion of generally L-shaped configuration and a porous core portion filled with a lubricant confronting and engaging the sidewall and bottom of the groove of said guide, said elongated rod members mounted so that the hard rigid peripheral surface portion engages the carriage and provides a physical support for maintaining the carriage in a predetermined spaced relation to the guide.

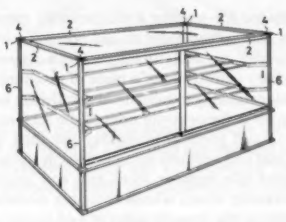


4,291,928

SHOWCASE

Kesaomi Kiyosawa, No. 22-1, 2-chome, Minamiaoyama, Minato-ku, Tokyo, Japan

Filed Dec. 6, 1979, Ser. No. 100,927
Claims priority, application Japan, Jul. 23, 1979, 54-100585[U]
Int. Cl.³ A47B *43/00;* **F16B** *12/00*
U.S. Cl. 312—257 R **5 Claims**



1. A showcase comprising:
a plurality of longitudinally-extending shelf pillars (7), each shelf pillar having a plurality of longitudinally spaced shelf receiving openings (14) formed therein;
a plurality of longitudinally-extending corner sashes (6), each corner sash having a central passageway (8) defined therein for receiving a shelf pillar and a longitudinally-extending slot (11) providing access to the openings in the shelf pillar, the corner sash having longitudinally-extending transversely spaced apart arms defining grooves for receiving plates forming sides of the showcase;
a plurality of horizontal tubes (2) positioned to interconnect upper ends of adjacent pairs of corner sashes;
means for interconnecting end portions of said hollow tubes with said corner sashes comprising:
a bolt (4),
coupling means (1) having a base portion (3) and protruding portions engageable with end portions of respective ones of said horizontal tubes, said base portion having a through bore (5) formed therein for passage of a shaft of said bolt, and
connecting means (12) positioned in an upper portion of a shelf pillar received in a corner sash and having a threaded portion for engaging an end of the shaft of said bolt (4) to thereby connect said coupling means to said connecting means; and
shelf support means for supporting a shelf (20) and having protruding portions (16) insertable into selected ones of the openings (14) formed in two adjacent shelf pillars to

thereby adjust the vertical position of the shelf with respect to the shelf pillars.

4,291,929

GUIDING RECIPROCABLE DRAWERS OF PIECES OF FURNITURE OR THE LIKE

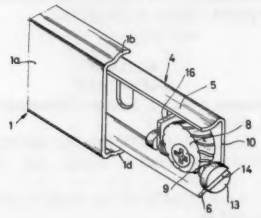
Karl-Volker Faust, Bielefeld, Fed. Rep. of Germany, assignor to Paul Hettich & Co., Kirchlengern, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,419

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851305

Int. Cl.³ A47B *88/00*; F16C *21/00*

U.S. Cl. 312—341 R **15 Claims**



1. A device for guiding a reciprocable member along an elongated path to and from an end position with respect to a second member, particularly for guiding a drawer with respect to a stationary constituent of a piece of furniture, comprising a pair of rails extending in substantial parallelism with each other and said path at the opposite sides of the reciprocable member and having end portions adjustably mounted in said second member, said end portions being accessible upon movement of said reciprocable member from said end position; first and second eccentric worm wheels rotatably mounted in said second member at the opposite sides of said reciprocable member and engaging with the end portions of the respective rails; first and second worms rotatably mounted in the end portions of the respective rails and meshing with the corresponding worm wheels so that rotation of each worm entails an angular displacement of the respective worm wheel and a corresponding adjustment of the respective rail relative to said second member, said worm wheels being rotatable about axes which are substantially normal to said path and said worms being substantially parallel to the respective rails and being accessible for rotation upon movement of said reciprocable member from said end position; and means for transmitting the adjustments of said rails to said reciprocable member.

4,291,930

GROUND LUG FOR ELECTRICAL CONNECTOR

Eleanor A. Landgreen, Whittier, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 12, 1979, Ser. No. 74,728

Int. Cl.³ H01R *4/66*

U.S. Cl. 339—14 P **9 Claims**

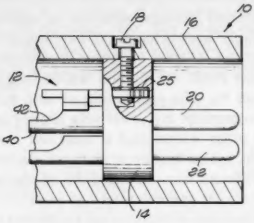
1. An electrical connector comprising:

an insulator containing at least one contact and a grounding lug;

a conductive shell surrounding said insulator;

said grounding lug comprising an electrically conductive body having an integral extension arm outside of said insulator resiliently biased against only one side of said contact to provide electrical connection therebetween;

said grounding lug body having a forward opening therein located within said insulator; and



fastener means extending through said shell into said opening to electrically connect said grounding lug to said shell.

4,291,931

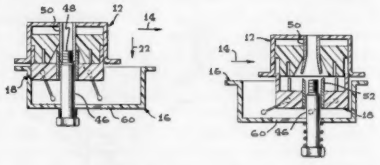
SHEAR PLANE SEPARABLE CONNECTOR

Lawrence J. Stupay, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Feb. 12, 1979, Ser. No. 11,384

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—45 R **10 Claims**



1. In a connection arrangement which includes a first connector movable from an initial position together with a vehicle means along a first direction, and which can be demated from a second connector by movement of the second connector in a demating second direction wherein the second direction is largely perpendicular to said first direction, the improvement of means for demating said connectors comprising:

means confining said second connector to movement along path portions wherein the path portions are angled by less than 90° from an imaginary line parallel to said first direction, during movement of said second connector in either of two opposite directions away from a predetermined deadcenter position;

stop means limiting movement of said second connector to an extreme position spaced away from said deadcenter position in a direction opposite to said first direction; and

spring means which urges said second connector in said demating second direction during initial movement of said second connector from said extreme position to said deadcenter position so that said spring means opposes such initial movement, and which urges said second connector in said demating second direction during subsequent movement beyond said deadcenter position and away from said extreme position to aid in such subsequent movement.

4,291,932

ELECTRICAL CONNECTOR RECEPTACLE ASSEMBLY

Larry R. Cox, Austin, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1980, Ser. No. 133,753

Int. Cl.³ H01R *13/52*

U.S. Cl. 339—60 R **7 Claims**

1. A electrical connector receptacle assembly adapted to

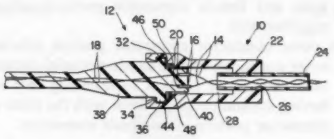
receive an electrical plug housing in a waterproof fashion wherein said plug housing has a longitudinal axis and includes at least one electrical contact, an axially protruding portion, a shoulder portion adjacent said protruding portion and a body portion adjacent said shoulder portion, said shoulder portion defining an engaging surface and a contacting surface located in axially spaced planes generally perpendicular to said longitudinal axis, said contacting surface being generally adjacent said protruding portion and said engaging surface being generally adjacent said body portion, said receptacle assembly comprising:

a receptacle housing means having a central cavity means for receiving at least a portion of said protruding portion;

at least one electrical conductor with an electrical conductor end thereon, and

a feed-thru tube means for containing in a nonrestrictive manner said at least one electrical conductor to allow axial movement thereof,

said receptacle housing means having a longitudinal axis and a first end defining an opening to said central cavity means for removable insertion of a portion of said plug housing,



said receptacle housing means having a second end which sealingly engages the outer periphery of said feed-thru tube means,

said first end including in sequential order, an entrance surface, a retaining surface which is adapted to abut said engaging surface of said plug shoulder portion, an annular recess, and an abutment surface for abutting the contacting surface of said plug shoulder portion, said retaining surface and said abutment surface being located in axially spaced apart planes generally perpendicular to said longitudinal axis,

said receptacle housing means, further including a seal located generally adjacent said abutment surface,

whereby when said electrical conductor end is first connected to said electrical contact and then said plug housing is inserted into said receptacle housing means, said contacting surface forms a fluid-tight engagement with said seal and said engaging surface engages said retaining surface thereby resisting disengagement of said plug housing and said receptacle housing means.

4,291,933

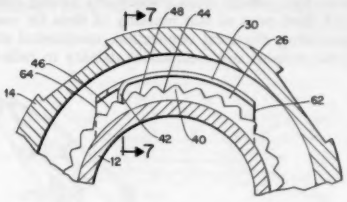
ELECTRICAL CONNECTOR HAVING IMPROVED NON-DECOUPLING MECHANISM

Aristotelis Kakaris, Chicago, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Feb. 11, 1980, Ser. No. 120,457
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—89 R **5 Claims**

1. An electrical connector comprising:

a cylindrical shell receiving an insert, said insert receiving at least one electrical contact, said shell including a plurality of ratchet teeth projecting from the outer surface of said shell; a coupling nut adapted to engage said cylindrical shell and a corresponding member matable with said cylindrical shell; a spring sector; a curved slot in the inside of said coupling nut for retaining said spring sector, said spring sector including a curved portion having opposing ends adapted to abut against the walls of said curved slot, and further including a spring finger bent inwardly from said curved portion, said finger including a free end, said free end engaging said ratchet teeth as said coupling nut is rotated, said spring finger providing less torque as said free end is pulled across said ratchet teeth than when said free end is pushed across said ratchet teeth, whereby said



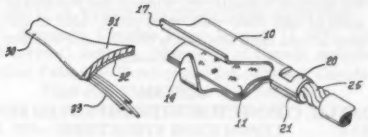
coupling nut will more easily rotate in one direction than the other.

4,291,934

CRIMP TYPE CABLE SHIELD BONDING DEVICE

August Kund, Glendale, Calif., assignor to Communications Technology Corp., Los Angeles, Calif.

Filed Feb. 28, 1980, Ser. No. 125,586
Int. Cl.³ H01R *11/20*
U.S. Cl. 339—95 R **7 Claims**



1. In a crimp type cable shield bonding device for electrical connection to the shield of a sheathed and shielded cable having an outer insulating sheath and an underlying conducting shield which enclose a bundle of conductors, the combination of:

a U-shaped clip having opposed wings and including integral fastener means for holding said wings together, and terminal means having opposed arms for receiving and clamping a conductor therebetween; and

a spring plate separate from said clip and overlying one of said wings and having a section bowed outward toward the other of said wings;

with said clip and plate adapted for receiving said sheath and shield between said plate and said other wing, with said plate being compressed when said wings are brought together with said sheath and shield therebetween, so that said compressed spring plate exerts contact pressure on said shield, and with said fastener means holding said wings together and holding said plate between said wings.

4,291,935

SELF-STRIPPING CONTACT ELEMENT FOR A CONNECTOR

Jean-Marie Badoz, and Daniel Merceron, both of Suresnes, France, assignors to Socapex and Souriau & Compagnie, both of Boulogne, France

Filed Mar. 27, 1979, Ser. No. 24,363
Claims priority, application France, Mar. 31, 1978, 78 09569
Int. Cl.³ H01K *11/20*
U.S. Cl. 339—97 R **4 Claims**

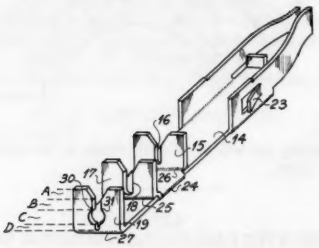
1. A contact element for connectors, for connecting wires covered by an insulating coating comprising:

a front portion for ensuring contact with a complementary contact element belonging to another circuit;

a rear portion for ensuring connection with one of said wires;

said rear portion having a plurality of open slots of different

widths for self stripping and connecting to said one of said wires by introduction of said one of said wires into said slots, said rear portion comprising successive first, second, and third parallel walls respectively having first, second, and third ones of said plurality of slots for respectively providing electrical connection, mechanical stability to axial stresses, and mechanical stability to radial stresses,



said third slot having a top part for receiving said one wire and a wire holding part, said third slot having, for shaping said one of said wires, a shaping part having a width smaller than the diameter of said one of said wires, opening at opposite ends thereof into said holding part and said top portion, respectively, wherein the portions of the two sides of said third wall on opposite sides of the shaping part of said third slot partly overlap one another.

4,291,936

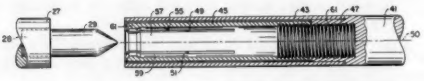
COAXIAL CONNECTOR WITH IMPROVED FEMALE CONDUCTOR STRUCTURE

William W. Oldfield, Redwood City, and Larry J. Bier, San Jose,both of Calif., assignors to Wiltron Company, Mountain View, Calif.

Continuation-in-part of Ser. No. 904,031, May 8, 1978, abandoned. This application Oct. 4, 1979, Ser. No. 81,831

Int. Cl.[3] H01R *17/18*

U.S. Cl. 339—177 R **14 Claims**



1. A precision connector for mechanically and electrically joining two ends of a coaxial circuit configuration, each characterized by an inner conductor positioned within an outer conductive shield surrounding the inner conductor, comprising:

a male connector portion attached to one of said coaxial circuit ends, said male portion comprising:

an electrically conductive pin attached at one end to an end of the inner conductor, said pin having a diameter significantly less than a diameter of said inner conductor end and having its other end formed into a point-like shape, and

an outer conductor connector portion attached to the outer conductor of said one coaxial circuit end, said outer connector portion surrounding said inner conductor pin without making electrical contact therewith, and

a female connector portion attached to the other of said coaxial circuit ends, said female portion comprising:

a tube-like electrically conductive member removably attached at one end to the inner conductor and another end remaining free to receive said pin therein when the male and female connector portions are joined, said member having a plurality of slots extending along its length a distance from its free end toward said one end, thereby to form a plurality of fingers having a radial spring characteristic, an opening of said member at said free end being slightly less in diameter than the diameter of said pin, thereby firmly contacting and gripping said pin when inserted in said free end opening, said tube-like member having beveled edges at its said another end in a manner that its leading edges are sloped from the outside surface to the inside surface in a direction toward said one end, and all edges of said fingers are rounded, thereby making insertion, rotation and removal of the pin therein with reduced wear,

a cylindrically shaped electrically conductive sleeve attached at one end to said inner conductor independent of the attachment of said one end of the tube-like member thereto and held free at its other end, said sleeve being characterized by having an outer diameter substantially equal to that of the inner conductor of the male connector portion and an inner diameter greater than an outer diameter of said tube-like member and a non-perforated outside surface, whereby no outside inner conductor surface irregularities exist when the male and female connector portions are connected together, and

an outer conductor connector portion attached to the outer conductor of said another coaxial circuit end, said outer connector portion surrounding said sleeve and having a mating configuration with the outer conductor connector portion of said male connector.

4,291,937

OPTICAL PANORAMIC SURVEY

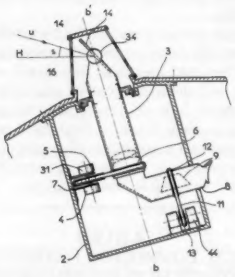
Jean-Jacques Baudot, Ville d'Avray, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Apr. 27, 1979, Ser. No. 34,020

Claims priority, application France, May 3, 1978, 78 13166

Int. Cl.[3] G02B *23/02*

U.S. Cl. 350—23 **2 Claims**



1. An optical device of the periscope type carried on a vehicle, comprising:

a sighting tube, having an optical axis, rotatably mounted in and having one end projecting from the vehicle;

a driving member fixed to the vehicle for rotating the tube about said optical axis;

a reflector placed at said one end of the tube and rotatable about a reflector axis disposed orthogonally with respect to said optical axis;

a central unit for providing electrical voltages representative, respectively, of the pitch angle and roll angle of the vehicle;

a first resolver having an input winding, a rotor and first and second primary windings connected to receive said voltages, respectively, from said central unit;

means for driving said rotor of said first resolver in synchronism with said sighting tube;

a second resolver for supplying an output voltage representative of a predetermined site angle;

a third resolver having a rotor and first and second primary windings which are respectively connected to the secondary winding of said first resolver and to said central unit to receive one of said voltages, said third resolver providing an output voltage;

a feedback loop for nulling the difference between the output voltage of said third resolver and the output voltage of said second resolver; and

means for transmitting the displacement of the rotor of the third resolver to the axis of said reflector with a 2:1 ratio.

4,291,938

APPARATUS FOR DARK FIELD ILLUMINATION

Dietmar Wagner, Sindelfingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1979, Ser. No. 99,052

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1978, 2852203

Int. Cl.³ G02B *21/06*

U.S. Cl. 350—91 **15 Claims**

1. Dark field illumination apparatus comprising:

an optical assembly defining a focal plane on one side thereof and having an object plane on the other side thereof;

means dividing the portion of said focal plane which is within the numerical aperture of said optical assembly into an annular region coaxial with the optical axis of said optical assembly and a central aperture region surrounded by said annular region;

a plurality of light conducting fibers each having one end face disposed within said annular region and directed toward said optical assembly; and

means for illuminating the other end faces of said light conductors, said object plane being dark field illuminated thereby when viewed through said central aperture region of said focal plane.

4,291,939

POLARIZATION-INDEPENDENT OPTICAL SWITCHES/MODULATORS

Thomas G. Giallorenzi, Springfield, and Richard A. Steinberg, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

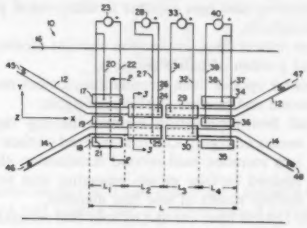
Filed Mar. 24, 1978, Ser. No. 889,666

Int. Cl.³ G02B *5/174*

U.S. Cl. 350—96.14 **16 Claims**

1. In an optical channel waveguide switch/modulator of the type having a two-channel region wherein phase shift of a propagating wave is effected by electrically modulating the modal propagation constant of at least one of said two channels, an improved electrode arrangement which provides polarization-independent operation comprising:

a first configuration of electrodes disposed in proximity to the channels to permit the application of an electric field



that is primarily horizontally directed in at least one channel; and

a second configuration of electrodes disposed in proximity to the channels to permit the application of an electric field that is primarily vertically directed in at least one channel.

4,291,940

LOW LOSS ACCESS COUPLER FOR MULTIMODE OPTICAL FIBER DISTRIBUTION SYSTEMS

Brian S. Kawasaki, Carleton Place; Kenneth O. Hill, Kanata, and Derwyn C. Johnson, Ottawa, all of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Jun. 13, 1977, Ser. No. 805,865

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.15 **9 Claims**

1. An access coupler comprising:

a first multimode optic fiber having a biconical taper section and a second multimode optic fiber having a biconical taper section, the taper sections fused together and twisted around one another along a predetermined length of said taper sections to provide optical coupling between the fibers.

4,291,941

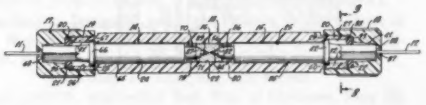
OPTICAL FIBER CONNECTOR

Erich G. Melzer, Redlands, Calif., assignor to The Deutsch Company Electronic Components Division, Los Angeles, Calif.

Filed Feb. 4, 1980, Ser. No. 118,468

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.18 **14 Claims**



1. An optical fiber connector comprising

a tubular receptacle having first and second opposite end portions, and a central portion intermediate said end portions,

a lens member received in said central portion of said receptacle,

said lens member having first and second opposite ends, said first and second opposite ends of said lens member

including first and second lens cavities, respectively, said cavities being opposite from each other,

said first and second ends having first and second tapered surface means, respectively,

a friction member at either end of said lens member for retaining said lens member in said central portion of said receptacle,

a first optical fiber termination element received in said first end portion of said receptacle,

a second optical fiber termination element received in said second end portion of said receptacle,

said first termination element having tapered surface means engaging said first tapered surface means of said lens member, said second termination element having tapered surface means engaging said second tapered surface means of said lens member,

a first optical fiber carried by said first termination element,

a second optical fiber carried by said second termination element,

said first and second termination elements including means for gripping said first and second fibers, respectively, so that the ends of said fibers are pressed axially into said first and second lens cavities, respectively,

a first retention means engaging said first termination element and said first end portion of said receptacle for retaining said first termination element in said receptacle,

a second retention means engaging said second termination element and said second end portion of said receptacle for retaining said second termination element in said receptacle,

said first and second termination elements being entirely received within said tubular receptacle and said first and second retention means,

a first seal within said first retention means, said first seal engaging said first retention member, said first end portion of said receptacle and said first termination element for preventing entry of foreign matter into said first end portion of said receptacle,

and a second seal within said second retention means, said second seal engaging said second retention member, said second end portion of said receptacle and said second termination element for precluding entry of foreign matter into said second end portion of said receptacle.

4,291,942

OPTO-ELECTRONIC COUPLING HEAD

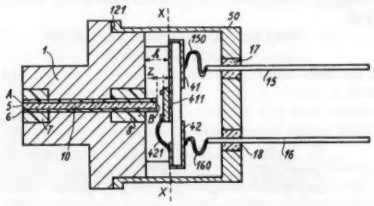
Raymond Henry, and Jacques Simon, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 5, 1980, Ser. No. 118,853

Claims priority, application France, Feb. 8, 1979, 79 03226

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.20 **4 Claims**



1. An opto-electronic coupling head comprising:

an opto-electronic component including electrical connections;

a support device for said opto-electronic component;

an optical fiber-holder which accommodates an optical fiber section;

an encasing device comprising a base formed by said fiber-holder and a cover, wherein the end of said fiber-holder situated on the same side as said component includes a system of wedges integral with said fiber-holder, said wedges defining by their coplanar faces a bearing plane for said support device of said component with said support device being fixed to said bearing plane in such a manner that the optimum optical converting efficiency of said opto-electronic component is attained, and wherein said cover has electrical through-leads; and

contact springs attached to said through-leads and bearing against said electrical connectors at a point along the extent of each of said connectors determined by the fixed location of said component on said wedged determined bearing plane, thus permitting the adjustment of the position of said opto-electronic component with respect to the optical fiber separately from the finishing of the tightness of said head.

4,291,943

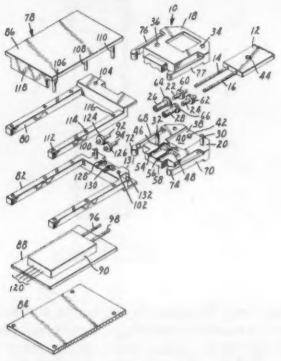
CONNECTOR FOR OPTICAL FIBER CABLES

Paul H. Binek, St. Paul; Thomas M. Cherney, Roseville; John M. Magnusson, Richfield, and Bryon J. Cronk, Hugo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 822,269, Aug. 5, 1977, abandoned. This application Feb. 21, 1980, Ser. No. 123,495

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.22 **17 Claims**



1. A connector for use with a flat cable containing a plurality of optical fibers supported in a flexible matrix and disposed parallel to each other, comprising

(a) a substantially flat housing member having

(i) internal support means defining a passageway corresponding in shape and size to a said cable for receiving and anchoring thereat an end of a said cable such that fibers of a cable received into the housing member may protrude beyond said support means, and

(ii) including means for securing said flexible matrix for anchoring said cable to said housing member while yet avoiding strain on the fibers such that repeated insertions and withdrawals of the connector is facilitated without weakening the fibers, and channel means in general alignment with said support means for receiving the fibers of a said cable with the ends of the fibers terminating proximate an opening through a front portion of the housing member to enable the fiber ends to be optically coupled to fibers within a mated connector abutting said front portion,

(b) a plurality of fiber retaining members adapted to be positioned within said channel means in the housing member, in axial alignment with the fibers, each of said retaining members having a smooth substantially cylindrical periphery and circular bore extending therethrough along the cylindrical axis and through which an end of an optical fiber of said cable may be inserted and anchored substantially coplanar with one end of the bore, the ends of the fiber and of the

retaining member being substantially normal to the axis of the bore,

(c) an alignment means having bores extending therethrough of substantially the same size and shape as the cylindrical periphery of the retaining members for receiving each of said fiber retaining members into one end thereof and for receiving into the other end thereof fiber retaining members of a mated connector enabling the respective received members to be substantially butted together to optically couple fibers enclosed therein while maintaining the thus coupled fibers in axial alignment, and

(d) engagement means positioned proximate side portions of the housing member having members adapted to be coupled to corresponding members of a said mated connector to cause said retaining members to be aligned with and received into the alignment means and to be maintained in said abutting relationship within the alignment means.

4,291,944

AUXILIARY CYLINDER FOR CAMERA

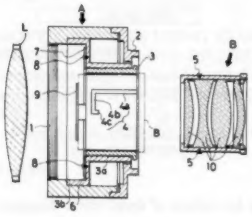
Hidetuka Nomura, Tokyo, Japan, assignor to Hideji Sato, Tokyo, Japan

Filed Jan. 2, 1979, Ser. No. 760

Claims priority, application Japan, Apr. 28, 1978, 53-58444[U]

Int. Cl.³ G02B *7/02*

U.S. Cl. 350—257 **7 Claims**



1. An auxiliary lens holding cylinder, comprising:

a main cylinder having a main photography lens holder on one end and a camera mounting fixture on the other end;

a main photography lens in said main photography lens holder and which is capable of being used by itself for one of a variety of types of photography; and

a sub-cylinder having a built-in lens for changing the type of photography which can be carried out by said main photography lens to another of a variety of types of photography and which is coaxially removably mounted in said main cylinder and extending into said main cylinder from the other end of said main cylinder, whereby when said auxiliary lens holding cylinder is mounted on a camera, said sub-cylinder is between the camera and said main photography lens.

4,291,945

PENTAGONAL ROOF PRISM FOR VIEWFINDER

Yoshisada Hayamizu, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

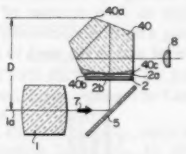
Filed Mar. 26, 1980, Ser. No. 134,203

Claims priority, application Japan, Jun. 12, 1979, 54/73841

Int. Cl.³ G02B *5/04*

U.S. Cl. 350—286 **5 Claims**

1. A pentagonal roof prism for a viewfinder, comprising a pentagonal prism having an apex and a planar surface located opposite said apex, said prism having a region formed therein adjacent said planar surface, said region having a non-uniform index of refraction, said region having a shape which cooperates with said non-uniform index of refraction to cause light passing into said prism through said planar surface to be refracted in the same manner as if said prism had a uniform index of refraction and said surface had a predetermined curvature.



4,291,946

MIRROR ARRANGEMENTS TO PROVIDE SIDE AND REAR VISION FOR TRACTOR WITH IMPLEMENTS

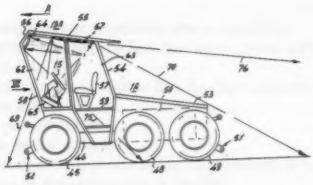
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Mar. 15, 1979, Ser. No. 20,733

Claims priority, application Netherlands, Mar. 17, 1978, 7802911; Mar. 17, 1978, 7802912

Int. Cl.³ B60R *1/04, 1/10*

U.S. Cl. 350—302 **31 Claims**



1. A vehicle such as an agricultural tractor which comprises: coupling means at the vehicle's rear for attachment of implements; a cab, an operator's seat and controls in said cab, said comprising front, side and rear walls and a roof, said side and rear walls including transparent windows and said front wall including a windshield; a first mirror in said cab disposed in front of said operator's seat; and a second mirror in said cab disposed substantially parallel to said roof and located at least in part above the space between said operator's seat and said windshield; said first and second mirrors disposed relative to each other and an operator of the vehicle in said operator's seat whereby at least part of an implement attached to said coupling means and surface of the ground at one lateral side of the tractor are visible to an operator viewing said first mirror from said operator's seat through images reflected from said second mirror to said first mirror.

4,291,947

PROCESS FOR MAKING A LIQUID CRYSTAL CELL

Werner Cirkler, Ismaning, and Hans Krüeger, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 17, 1979, Ser. No. 40,040

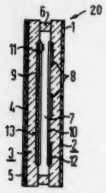
Claims priority, application Fed. Rep. of Germany, May 30, 1978, 2823630

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—336 **7 Claims**

1. A process for the manufacture of a liquid crystal cell wherein each of the carrier plates supports an electrode formed of a conductive coating received in a recess with the thickness of the electrode equal to the depth of the recess so that the electrode is flush with the adjacent insulating layer, said process comprising providing a carrier plate, coating a surface of the carrier plate with a photo resist, exposing and

developing the photo resist to remove portions of the photo resist to form a mask which exposes portions of the surface of the carrier plate in a pattern of the electrodes to be applied thereon, deep etching the exposed portions of the surface of the carrier plate to form recesses of a given depth, subsequently applying a layer of electrically conductive material in each etched recess and on the mask to a thickness equal to the



depth of the recesses, then removing the remaining mask with the conductive layer disposed thereon so that the conductive layer is disposed in each recess extends flush with the surface of the carrier plate, then applying an additional layer of insulating material on the conductive layer and surface of the carrier plate and subsequently rubbing the insulating material to provide an orientation layer.

4,291,948

LIQUID CRYSTAL DISPLAY INCORPORATING POSITIVE AND NEGATIVE SMECTIC MATERIAL

William A. Crossland, Harlow; Joseph H. Morrissy, Dunmow, and David Coates, Bishop's Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,869

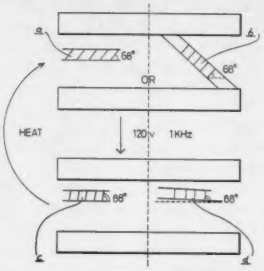
Claims priority, application United Kingdom, Nov. 10, 1977, 46819/77; Nov. 10, 1977, 46820/77; Nov. 10, 1977, 46821/77

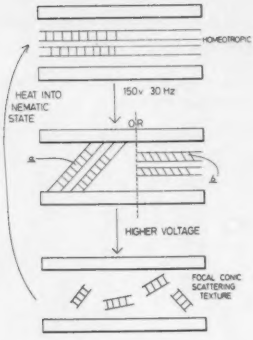
Int. Cl.[3] G02F *1/13*; C09K *3/34*

U.S. Cl. 350—340 **14 Claims**

1. An internally electroded liquid crystal display cell comprising a layer of smectic material that exhibits positive dielectric anisotropy sandwiched between two electroded plates having electrodes that overlap at least in part, at least one of which plates is transparent, wherein at least one surface of the plates is such that when the layer is taken into a smectic phase from a less ordered non-smectic phase by cooling in the absence of an applied electric field the layer is caused to assume parallel homogeneous alignment having a non-zero tilt angle, said surface provided by an oblique evaporation performed under conditions which promote parallel homogeneous alignment with a non-zero tilt angle wherein said surface is further treated with a homeotropic alignment inducing surfactant to increase said tilt angle.

8. An internally electroded liquid crystal display cell comprising a layer of smectic material that exhibits negative dielectric anisotropy sandwiched between two electroded plates having electrodes that overlap at least in part at least one of which plates is transparent, and wherein at least one surface of the plates is such that, when the layer is taken into a smectic phase from a less-ordered non-smectic phase by cooling it in the absence of an applied electric field, the layer is caused to assume substantially homeotropic alignment with too large a





tilt angle for the formation of focal conic domains observable by optical microscopy in polarized light.

4,291,949

POSITIVE-TYPE DISPLAY DEVICE USING GUEST-HOST TYPE MIXTURE OF LIQUID CRYSTALS AND DYES

Masanobu Wada, No. 8-22 Kamisugi 5-chome, Sendai-shi, Miyagi-ken, Japan; Tatsuo Uchida, Sendai, and Toru Teshima, Yokohama, both of Japan, assignors to Masanobu Wada, Sendai and Stanley Electric Co., Tokyo, both of, Japan

Filed Jun. 20, 1979, Ser. No. 50,299

Claims priority, application Japan, Dec. 27, 1978, 53-160147

Int. Cl.[3] G02F *1/133*

U.S. Cl. 350—349 **2 Claims**

1. A positive-type display device comprising:

two substrates disposed in substantially parallel relationship to each other with a spacer provided between the ends of said two substrates to form a closed space;

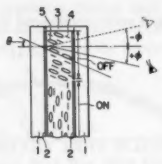
an electrode film within said closed space adherently attached to the surface of each of said two substrates;

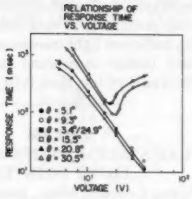
an alignment film formed on at least one of said electrode films; and

a mixture consisting essentially of at least one nematic liquid crystal having a negative dielectric anisotropy and at least one pleochroic dye, said mixture retained within said closed space,

wherein the surfaces of said electrode film and said alignment film in contact with said mixture have been treated to orient the longitudinal axes of the molecules contained

in said mixture at an angle greater than 10° up to 30° relative to normal of the plane of said substrate when said





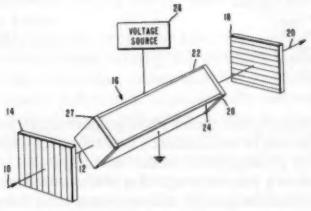
molecules are in their quiescent state with no applied voltage.

4,291,950

ELECTRO-OPTIC DEVICES USING STARK-INDUCED BIREFRINGENCE AND DICHROISM

David M. Pepper, Los Angeles, and Marvin B. Klein, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 8, 1980, Ser. No. 138,463
Int. Cl.³ G02F *1/17*
U.S. Cl. 350—389 **7 Claims**



1. An optical device comprising:

first and second polarizers spaced from one another along a predetermined path and having their respective pass directions for linearly polarized light oriented perpendicular to one another;

a Stark cell disposed along said path between said first and second polarizers and having a pair of spaced electrodes disposed in respective planes parallel to said path and perpendicular to a predetermined direction other than parallel or perpendicular to the pass direction of said first polarizer;

means for directing a beam of light including a predetermined frequency through said first polarizer and said Stark cell along said path;

a gaseous medium contained within said Stark cell, said medium exhibiting a dichroic absorption resonance in the vicinity of said predetermined frequency for light polarizations parallel and perpendicular to said predetermined direction and further exhibiting birefringence at frequencies slightly above and slightly below the frequency of said absorption resonance for said parallel and perpendicular light polarizations; and

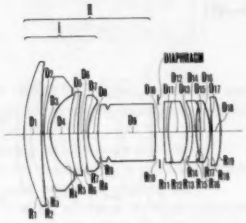
means for applying a voltage between said Stark cell electrodes to controllably vary the frequency of said absorption resonance.

4,291,951

COMPACT TYPE RETROFOCUS LENS

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1979, Ser. No. 102,538
Claims priority, application Japan, Dec. 15, 1978, 53-156101
Int. Cl.³ G02B *13/04*
U.S. Cl. 350—458 **2 Claims**



1. A compact type retrofocus lens comprising:

a first positive meniscus lens having a convex surface at the object side;

a second negative meniscus lens having a convex surface at the object side;

a third positive lens;

a fourth negative lens;

a fifth bi-convex lens the radius of curvature of whose lens surface at the object side is smaller;

a diaphragm;

a sixth combined positive lens which has a convex surface with convergent effect at the object side and the radius of curvature of whose lens surface at the image side is smaller;

a seventh bi-concave lens the radius of curvature of whose lens surface at the object side is smaller;

an eighth positive meniscus lens having a concave surface at the object side; and

ninth positive meniscus lens having a concave surface at the object side;

in sequence from the object side, whereby the sign of the radius of curvature of the image side lens surface of the third is same as that of the object side lens surface and the following relations are established:

(1) $FI<0,\ 0.5F \leqq |FI| \leqq 0.75F$

(2) $FII<0,\ 2.5F \leqq |FII| \leqq 4.5F$

(3) $0.32 \leqq (D_9+D_{11}+D_{12})/L \leqq 0.44$

(4) $0<|1/R_{13}|-|1/R_{14}| \leqq 0.18/F$

(5) $0.02F \leqq D_{13} \leqq 0.1F$

(6) $0.015/F \leqq (N_7-N_6)/R_{12} \leqq 0.135/F$

wherein:

F: Focal length of the whole system

FI: Compound focal length of the first lens to the fourth lens

FII: Compound focal length of the first lens to the fifth lens

L: Total lens length from the object side surface of the first lens to the image side surface of the ninth lens

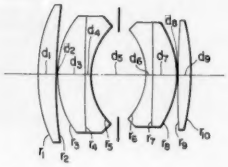
D_9: Thickness of the fifth lens along the optical axis
$D_{11}+D_{12}$: Thickness of the sixth combined lens along the optical axis
N_6, N_7: Refractive index (d line) of the negative lens and the positive lens in the sixth lens
D_{13}: Distance between the surface of the sixth and the seventh lens.

4,291,952

GAUSS TYPE LENS SYSTEM

Hiroshi Takase, Hachiouji, and Toru Fujii, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1980, Ser. No. 112,607
Claims priority, application Japan, Jan. 26, 1979, 54-7840
Int. Cl.³ G01B *9/42*
U.S. Cl. 350—471 **7 Claims**



1. A Gauss type lens system comprising a first, second, third and fourth lens components, said first lens component being a positive meniscus lens, said second lens component being a cemented doublet consisting of a positive lens and negative lens, said third lens component being a cemented doublet consisting of a negative lens and positive lens, said fourth lens component being a biconvex lens, said Gauss type lens system satisfying the following conditions:

(1) $(\nu_1+\nu_5+\nu_6)/3<39$, ν_3, $\nu_4<30$
(2) $1.7<n_1, n_5, n_6$
(3) $0.07<n_3-n_2<0.21$
(4) $0.13\ f<d_3+d_4<0.17\ f$
(5) $0.9<f_1/f_6<1.3$
(6) $0.58\ f<r_1<0.72\ f$

wherein reference symbols ν_1, ν_3, ν_4, ν_5 and ν_6 respectively represent Abbe's numbers of the first lens component, lens on the image side in the second lens component, respective lenses constituting the third lens component, and fourth lens component, reference symbols n_1, n_2, n_3, n_5 and n_6 respectively represent refractive indices of the first lens component, respective lenses constituting the second lens component, lens on the image side in the third lens component, and fourth lens component, reference symbols d_3 and d_4 respectively represent thicknesses of respective lenses constituting the second lens component, reference symbol r_1 represents the radius of curvature of the lens surface on the object side of the first lens component, reference symbols f_1 and f_6 respectively represent focal lengths of the first and fourth lens components and reference symbol f represents the focal length of the lens system as a whole.

4,291,953

OCULAR MEMBRANE AND METHOD FOR PREPARATION THEREOF

William S. Covington, West Cornwall, Conn., assignor to Permavision, Paramus, N.J.

Division of Ser. No. 848,518, Nov. 4, 1977, Pat. No. 4,182,723. This application Aug. 31, 1979, Ser. No. 71,171
Int. Cl.³ G03C *21/46*
U.S. Cl. 351—160 H **3 Claims**

1. An ocular membrane formed from a composition comprising a copolymer of a polysiloxane cross-linked by addition polymerization and a compound selected from the group consisting of:

(a) esters of glycidyl alcohol with acrylic acid or methacrylic acid; and
(b) maleic anhydride, nadic anhydride or hexahydrophthalic anhydride;

the amount of each such compound in said copolymer being

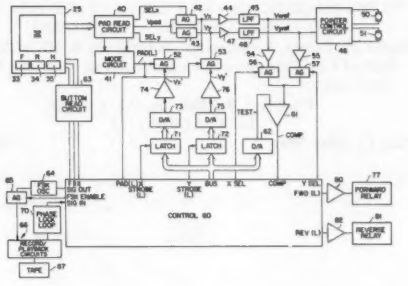
effective to impart wettability to the surface of articles formed from said copolymer but less than that which would destroy the hydrophobic properties of said copolymer, and said composition having sufficient light transmission for use as an ocular membrane, said ocular membrane having an average extrapupillary thickness of less than 0.10 mm.

4,291,954

AUDIOVISUAL SYSTEM WITH IMPROVED MOVING LIGHT POINTER

Stewart W. Wilson, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 24, 1980, Ser. No. 114,997
Int. Cl.³ G03B *21/00, 31/00*
U.S. Cl. 353—42 **19 Claims**



1. Apparatus for use with a photographic image projector of the type that can be automatically controlled to project images recorded on photographic media, said apparatus controlling the position of a pointer image that is suspended with respect to the projected image and said apparatus comprising:

A. positioning control means for generating first positioning control signals in a first form,
B. positioning means for positioning the pointer image with respect to the projected image in response to positioning control signals in the first form,
C. first signal conversion means for converting the positioning signals from said positioning control means to signals in a second form adapted for being recorded,
D. mode selection means connected to said positioning control means and said positioning means for coupling the first positioning control signals to said positioning means during first mode of operation,
E. second signal conversion means connected to said mode selection means for generating second positioning control signals in the first form in response to signals in the second form, said mode selection means alternatively coupling the second positioning control signals to said positioning means during a second mode of operation, and
F. latch means connected to said first and second signal conversion means for storing successive first position control signals in said second form during said first mode and for providing the last stored of said first position

control signals to said second conversion means after said first mode of operation in order to maintain the last pointer range position from said first mode, said latch means otherwise operating during said second mode to store and input said second signal conversion means with previously recorded signals of the second form.

4,291,955

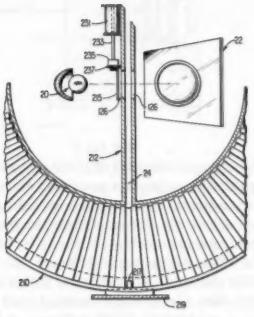
GRAVITY-FEED ROTARY TRAY SLIDE PROJECTOR

Fernando Alvarez-Sabater, P.O. Box 3628, Caracas 101A, Caracas, Venezuela

Continuation-in-part of Ser. No. 52,952, Jun. 27, 1979, Pat. No. 4,232,953. This application Jun. 26, 1980, Ser. No. 163,350

Int. Cl.³ G09F *11/30*; G03B *23/02*

U.S. Cl. 353—111 **3 Claims**



1. A combined slide projector and rotary slide tray,

said slide tray having slots for receiving slides opening inwardly, the slots having partially open outer edges, adjacent slots being at least partially separated from each other by separators having at least partially inwardly recessed outer edges;

said slide projector comprising a housing, central hub means positioned in said housing for rotatably supporting said slide tray, means for rotating said slide tray with respect to said central hub means, a substantially vertical slide passage defined in said hub means having an upper entrance end and a lower exit end alignable with said slots of said slide tray, a projection aperture formed in said slide passage, means including lamp means and projecting optics means for projecting a slide aligned with said projection aperture, shutter means for blocking said projection aperture, and control means for controlling movement of said shutter means comprising sensing means supported by said housing in alignment with said slide passage with switch means positioned to protrude into said slots and into the recessed portions of said outer edges, said switch means being closable by insertion of a properly oriented slide into a slot aligned with said slide passage exit, said control means further comprising means responsive to closing of said switch means for moving said shutter means from a projection aperture blocking position to an unblocking position;

the relationship between said slide tray and said slide projector being such that a slide is movable by gravity during rotation of said slide tray from a slot in said slide tray into said entrance end of said slide passage, is movable by gravity through said slide passage into a position resting on a slide previously introduced into said slide passage and in alignment with said projection aperture, and is movable by gravity out of the exit end of said slide passage into a slot in said slide tray.

4,291,956

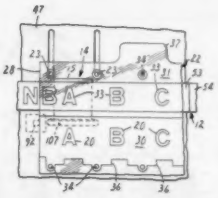
GRAPHIC FORMING DEVICE WITH PREVIEW FEATURE

Peter J. Vogelgesang, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 17, 1979, Ser. No. 104,574

Int. Cl.³ G03B *17/06*

U.S. Cl. 354—14 **1 Claim**



1. In a device useful for forming graphics such as letters, symbols or pictures along a strip of radiation sensitive material, said device comprising:

means for defining an exposure station;

means adapted for positioning a predetermined portion of a said strip at said exposure station; and

means adapted to be actuated at said exposure station for momentarily irradiating the predetermined portion of a said strip at said exposure station in a sharply defined graphic pattern, including:

a template comprising a thin radiation transparent member with a radiation blocking coating having sharply defined open areas corresponding in shape to graphics to be formed to provide radiation transmissive windows through said template;

means for mounting said template to register one of the windows at said exposure station; and

radiation means for briefly irradiating the portion of the strip at said exposure station through the aligned window, comprising a flash lamp; means mounting said flash lamp for movement between a normal position spaced from said exposure station to afford visible inspection of said template and said radiation sensitive material portion at said exposure station, and an expose position with said flash lamp closely adjacent the exposure station; and means for operating said flash lamp upon movement of the flash lamp to its expose position, the improvement wherein:

said coating on said template has a viewing opening adjacent each of said windows;

for each of said windows said template has a positive image of that window within said viewing opening, which image is positioned with a predetermined relationship with respect to that window;

said template has locating orifices at a predetermined location with respect to said windows;

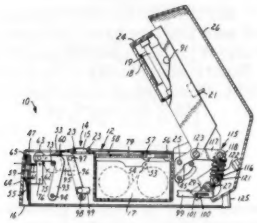
said means for mounting said template comprises locating members adapted to enter said locating orifices and means mounting said locating members for movement between an exposure position with the window associated with the locating orifices located at said exposure station, and a preview position with the positive image corresponding to the window associated with the locating orifices positioned at the exposure station at the position in which the window is located when the locating members are in their exposure position; and

said device includes means coupled between said means mounting said flash lamp for movement and said means for mounting said template for positioning said locating members in said preview position when said flash lamp is in its normal position, and for positioning said locating members in said exposure position when said flash lamp is in its expose position.

4,291,957
GRAPHIC FORMING DEVICE WITH TOGGLE CLAMPED LAMP ARM

Elmont E. Hollingsworth, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 17, 1979, Ser. No. 104,651
Int. Cl.[3] B41B *19/00*
U.S. Cl. 354—14 2 Claims



1. In a device useful for forming a series of graphics such as letters, symbols or pictures along a strip of radiation sensitive material, said device comprising:

a frame;

means on said frame for defining an exposure station;

means mounted on said frame adapted for moving a said strip through said exposure station to position a predetermined portion of the strip at said exposure station; and

means adapted to be actuated at said exposure station for momentarily irradiating a portion of the strip at said exposure station in a sharply defined graphic pattern, including:

a template comprising a thin radiation transparent member with a radiation blocking coating having sharply defined open areas corresponding in shape to graphics to be formed to provide radiation transmissive windows through said template;

means on said frame for mounting said template to register the windows at said exposure station;

pressing means for releasably clamping said template at said exposure station in intimate contact with the portion of the strip at the exposure station; and

radiation means for briefly irradiating the portion of the strip at said exposure station through the aligned window, comprising flash lamp, an arm supporting said flash lamp at one end and having a second end mounted on said frame for pivotal movement to move said lamp between a normal position spaced from said exposure station to afford visible inspection of said template and the portion of the strip at said exposure station, and an expose position with said lamp closely adjacent the exposure station, and means for operating said flash lamp upon movement of the lamp to its expose position and activation of said pressing means, the improvement wherein:

said means for defining an exposure station comprises a resilient pad supported on said frame;

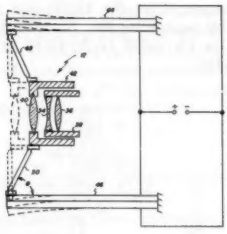
said arm includes a transparent plate having one surface adapted to engage radiation sensitive material at said exposure station on its side opposite said resilient pad and supports said lamp adjacent the surface of said plate opposite said one surface; and

said pressing means comprises a toggle linkage including first and second bars having adjacent ends pivotably joined together to form a knee and opposite second ends, the second end of said first bar being pivotably attached to said frame and the second end of said second bar being pivotably attached to said arm; and an activating lever pivotably mounted at one end on said frame and having a portion adapted to engage said knee and straighten said toggle linkage upon pivotal movement of said actuating lever from a raised to a lowered position to move said arm to said expose position and press said plate toward said pad.

4,291,958
CAMERA WITH ELECTRONIC FLASH AND PIEZOELECTRIC LENS MOTOR

Lee F. Frank, and James K. Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1980, Ser. No. 193,771
Int. Cl.[3] G03B *3/10*
U.S. Cl. 354—25 10 Claims

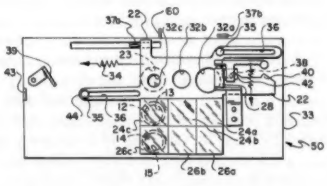


1. In a photographic camera of the type having a moderately high voltage power supply for powering electronic flash apparatus, and an adjustable focus lens including a lens element movable to adjust the focus, automatic focusing apparatus comprising: means for sensing a scene to be photographed and producing a focus signal representative of the proper focus adjustment for the scene; piezoelectric motor means coupled to said movable lens element for moving said lens element in response to a moderately high voltage; and control circuit means electrically connected to said moderately high voltage power supply and responsive to said focus signal for applying a metered amount of power from said power supply to said piezoelectric motor means to move said lens element to said proper focus adjustment.

4,291,959
PHOTOGRAPHIC APPARATUS

Donald O. Easterly, Rush, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1980, Ser. No. 209,349
Int. Cl.[3] G03B *7/085, 7/087, 7/18, 15/05*
U.S. Cl. 354—31 5 Claims



1. In a photographic apparatus including:

adjustable diaphram means providing a plurality of different-size exposure apertures;

a first light sensor for sensing the ambient light reflected from a photographic subject, and for providing an output indicative of such ambient light;

means responsive to the output from the first light sensor for adjusting the diaphragm means; and

an electronic flash unit including a flash producing means for emitting a predetermined amount of flash light toward the photographic subject, a second light sensor for sensing

flash light reflected by the subject as a result of flash light transmitted thereto by the electronic flash unit and for providing an output indicative of such flash light, and a quench circuit for terminating the generation of flash light by the flash producing means in response to the output from the second light sensor, the improvement comprising:

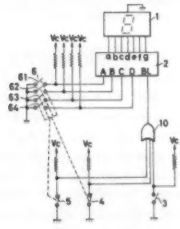
adjustable light control means coupled to the diaphragm means for changing the amounts of incident ambient light transmitted to the first sensor in a first sequence as a function of the diaphragm setting and for changing the amounts of flashlight transmitted to the second light sensor in a second sequence as a function of the diaphragm setting so as to vary the ratio of ambient exposure light to flash exposure light in accordance with the selected exposure aperture.

4,291,960

DISPLAY DEVICE

Tadashi Ito, Kanagawa; Hiroyasu Murakami, Tokyo; Masayuki Suzuki; Masayoshi Yamamichi, both of Kawasaki; Nobuaki Sakurada, Kanagawa, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 825,081, Aug. 16, 1977, abandoned.
This application Mar. 6, 1979, Ser. No. 17,923
Claims priority, application Japan, Sep. 3, 1976, 51-105458
Int. Cl.[3] G03B *17/20*
U.S. Cl. 354—53 **15 Claims**



1. A display system including:

(a) a display information signal forming circuit for producing a signal corresponding to display information,

(b) a display circuit for displaying the display information in response to said signal from display information signal forming circuit,

(c) manually operated display control switch means for controlling the operation of said display circuit and for setting said display circuit into either a display state and a non-display state,

(d) display control means for controlling a display by said display circuit independently of said display control switch means, said means being arranged to produce a display signal automatically when a display operation is necessary; and

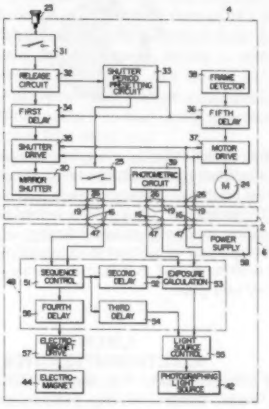
(e) warning information signal forming circuit for forming warning information, said display circuit being set into said display state in response to display signal independently of said display control switch means for displaying the warning information instead of said display information.

4,291,961

APPARATUS FOR ENDOSCOPIC PHOTOGRAPHY

Syuichi Takayama, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Japan

Filed Mar. 25, 1980, Ser. No. 133,668
Claims priority, application Japan, Apr. 16, 1979, 54-46975
Int. Cl.[3] A61B *1/04, 3/14*
U.S. Cl. 354—62 **9 Claims**



1. An apparatus for endoscopic photography, comprising:

a light source unit that includes light source means for introducing into the endoscope both diagnostic light, to enable the operator to examine the object that is to be examined, and photographing light, for making a photograph of the object; said light source unit further including means for interrupting the introduction of said diagnostic light into the endoscope;

first delay circuit means for initiating the opening of a shutter of a camera responsive to the depression of a shutter release button of the camera after the introduction of said diagnostic light from said light source unit into the endoscope is interrupted;

an exposure calculating circuit for determining a proper exposure;

second delay circuit means for causing said exposure calculation circuit to initiate its operation a first predetermined time after the shutter is opened;

third delay circuit means for allowing the introduction of said photographing light from said light source unit into the endoscope a second predetermined time after the initiation of operation of said exposure calculation circuit; and

fourth delay circuit means for reinitiating the introduction of said diagnostic light from said light source unit into the endoscope after completion of the exposure of a film disposed within the camera and after the shutter has been fully closed.

4,291,962

LENS MASK FOR CAMERAS AND PHOTOGRAPHIC METHOD

Thomas Jackson, 14580 Woodmont, Detroit, Mich. 48227

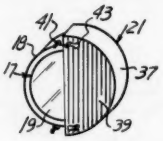
Filed Jun. 27, 1980, Ser. No. 163,785
Int. Cl.[3] G03B *15/00*
U.S. Cl. 354—122 **3 Claims**

1. In the combination with a camera having a housing enclosing and mounting a film unit, a viewing window and a lens assembly including a normally closed shutter and a lens;

a lens mask removably and adjustably mounted upon said lens assembly, including an upright opaque end face overlying and blocking one-half of the lens upon one side of a vertical plane through its optical axis;

whereby the image of a first object sighted through one side half of the viewing window will pass through the unmasked part of said lens and expose one-half of said film unit;

said lens assembly including a tube on said housing enclosing said lens;



said lens mask including a semi-cylindrical body mounted upon said tube, said end face being mounted upon one end of said body and semi-circular in shape; and

laterally spaced pairs of vertically spaced headed pins on and extending forwardly of said housing

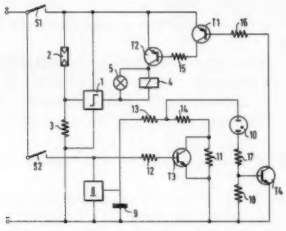
there being a pair of bayonet slots formed adjacent to the top and bottom of said end face cooperatively receiving one pair of said pins.

4,291,963

ELECTRONIC FLASHER

Hermann Körber, Bünde, Fed. Rep. of Germany, assignor to Balda-Werke, Bünde, Fed. Rep. of Germany

Filed Jul. 16, 1979, Ser. No. 57,687
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—128 **4 Claims**



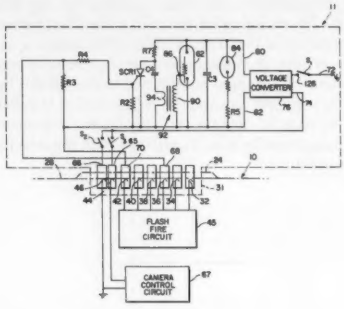
1. In a flash device for a camera of the type including a two-way switching means movable between a first open circuit position and a second closed circuit position, an electromagnet operatively connected to said switching means, said electromagnet being magnetically active when said two-way switching means is in said second closed circuit position, said two-way switching means and said electromagnet being cooperable for thereby forming a relay, a conventional high-voltage flasher having a charging circuit of the type including a high-voltage capacitor, said relay being operatively connected to said charging circuit and controlling current feed to said high-voltage capacitor therein as a function of the level of charge thereof, and a charge indicating means operatively connected to said high-voltage capacitor and said electromagnet for controlling said electromagnet as a corresponding function of voltage present thereon, said charge indicating means providing an operator of said device with a positive indication that said device is ready to flash, the improvement comprising a means connected to said charge indicating means and said high-voltage capacitor in said charging circuit of said device for producing a hysteresis in said connection therebetween, whereby a positive indication produced in said charge indicating means is extinguished at a lower voltage on said high-voltage capacitor than is initially required to produce said positive indication on said charge indicating means.

4,291,964

STROBE SWITCH WITH CAMERA CONTROL FEATURE

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 28, 1980, Ser. No. 116,268
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—145 **6 Claims**



1. An electronic flash apparaus for use with a camera of the type having means for fixedly and electrically connecting to a source of artificial illumination and means for automatically controlling an exposure cycle in an ambient mode absent the connection of the source of artificial illumination and in a flash mode responsive to the electrical connection of the source of artificial illumination to the camera electrical connecting means in a manner operating to electrically short at least two spaced apart mode select terminals on the camera connecting means thereby enabling the automatic exposure control means to provide a flash fire signal to the source of artificial illumination by way of the electrical connecting means at the appropriate instant during an exposure interval, said electronic flash apparatus comprising:

a housing;

circuit means responsive to the flash fire signal from the camera for providing a flash of artificial illumination; and

switch means connectable to a source of electrical energy for controlling the application of electrical energy to said circuit means, said switch means further including means connectable to the spaced apart mode select terminals of the camera connecting means for electrically shorting the mode select terminals to switch the camera to its flash mode of operation in response to the closure of said switch means to energize said circuit means, said switching means also including at least three switch contacts simultaneously switchable from an open circuit condition to a short circuit condition, two of said switch contacts serving to control the application of electrical energy to said circuit means in a manner whereby open circuiting said two switch contacts operates to electrically isolate said circuit means from the camera and the other of said switch contacts in cooperation with one of said two switch contacts serving to control the electrical short circuiting of the camera mode select terminals.

4,291,965

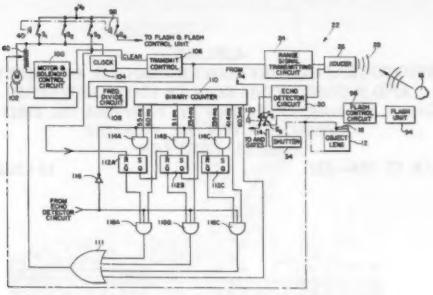
APPARATUS FOR AUTOMATICALLY SELECTING A PRESELECTED FOCAL POSITION FOR A LENS SYSTEM

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 6, 1980, Ser. No. 194,572
Int. Cl.³ G03B *3/10, 15/03*
U.S. Cl. 354—195 **8 Claims**

1. In an apparatus for automatically focusing image forming

rays at a focal plane having ranging means for deriving a signal indicative of the range of a subject from the apparatus, a variable focusing objective lens assembly having at least one lens element displaceable to different focal positions so that at each focal position the image carrying light rays from a subject at corresponding different distance ranges from the apparatus are focused at the focal plane, means for mounting the lens assembly for movement of its lens element to the different focal positions, and positioning means responsive to the ranging means for positioning the lens element to a focal position corresponding to the subject range, the improvement comprising:



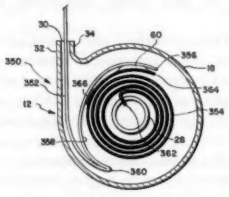
manually actuatable means for disabling the ranging means and for signalling the positioning means to automatically move a lens element to a preselected one of the focal positions.

4,291,966

PHOTOGRAPHIC FILM ASSEMBLAGE

Leonard V. Bendoni, Framingham, and Lawrence E. Green, Burlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 3, 1980, Ser. No. 136,801
Int. Cl.³ G03B *17/26*
U.S. Cl. 354—275 **9 Claims**



1. A photographic film assemblage for use with commercially available still picture cameras of the type having means for operably locating a single reel cassette of film of the non-self-developing type which is adapted to have sequentially photographically recorded thereon a plurality of discrete subject images when utilized in such cameras, and which cassette includes a generally cylindrical housing of a given diameter and a given length with an elongate light sealed opening extending therethrough and a spool mounted within the cylindrical housing for rotation about an axis extending lengthwise of the cylindrical housing and including a central portion around which an elongate strip of non-self-developing type film is coiled with one end thereof extending through the light sealed opening, said photographic film assemblage comprising:

a generally cylindrical housing of substantially said given length and diameter, said housing including means for defining an elongate light sealed opening extending lengthwise thereof;

support means located within said cylindrical housing for rotation about an axis extending lengthwise of said cylindrical housing;

an elongate composite film structure coiled within said cylindrical housing, said structure including a first sheet having a first end extending through said elongate light sealed opening and a second end located within said cylindrical housing and including therebetween a given length of unexposed self-developing type film sufficient to accommodate the sequential recording thereon of a plurality of discrete subject images, and a second sheet having a first end secured to said support means, a second end located in superposed relation to said second end of said first sheet, and an intermediate portion secured to said first sheet at a location spaced from but closely adjacent to said second end of said first sheet; and

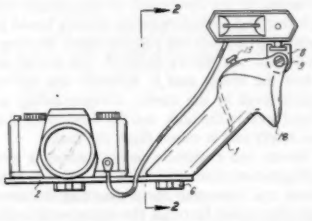
a container of processing liquid secured to one of said second ends and facing the other of said second ends such that its contents may be spread between said first and second sheets, subsequent to the exposure of said first sheet, to initiate the formation of a visible image within said composite film structure.

4,291,967

POSITIVE LOCKING ADJUSTABLE MOUNT FOR CAMERA AND FLASH

Andrew H. Jackson, Jr., 808 Birch St., Collinsville, Ill. 62234

Filed Sep. 26, 1980, Ser. No. 190,922
Int. Cl.³ G03B *15/02, 17/56*
U.S. Cl. 354—293 **10 Claims**



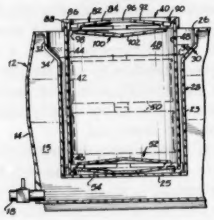
1. A photographic apparatus for holding a camera and a flash unit comprising in combination, a flashshoe having a positive locking positioning means, a baseplate having a positive locking positioning means, and a handgrip having a base on one end in a plane at about a forty-five degree (45°) angle to the longitudinal axis of the handgrip and having in said base of positive locking means permitting adjustable engagement with the positive locking positioning means in the baseplate at incremental angles about an axis perpendicular to said baseplate, and having at its opposite end a mating means for permitting rotational mounting of the flashshoe rotational means and mating positive locking positional means permitting adjustable engagement with the positive locking positioning means in the flashshoe, and further having a contoured lip on the same end as the means for engaging said flashshoe, said lip located on the side of the handgrip permitting it to rest upon the thumb-index finger arch of the user's hand holding the handgrip, such that said handgrip can be securely attached to the baseplate at about 45° angle to the plane in which the baseplate lies and at any one of a number of positions about an axis perpendicular to the baseplate to permit comfortable holding of a camera and the flashshoe can be incrementally positioned and positively locked to securely hold a flash unit relative to the baseplate mounted camera for either horizontal or vertical format photography.

4,291,968

DAYLIGHT DEVELOPING APPARATUS FOR PHOTOGRAPHIC FILM

Gerald Work, E. 1701 20th, Spokane, Wash. 99203

Filed Nov. 26, 1979, Ser. No. 97,374
Int. Cl.³ G03D *3/00*
U.S. Cl. 354—313 **3 Claims**



1. A daylight developing apparatus for developing photographic film without a darkroom, comprising:

a developing tank for receiving photographic treating liquid at a desired liquid level and for receiving a light impermeable photographic film carrier therein having photographic film therein to permit the film carrier to be lowered into the tank to immerse the photographic film in the photographic treating liquid below the desired liquid level without the photographic film being subjected to room light;

said carrier comprising a light impermeable upright side wall extending between an upper end and a lower end forming an interior cavity therein to receive the photographic film;

said carrier comprising a lower end enclosure means mounted to the lower end of the upright side wall;

said lower end enclosure means having liquid passage means formed to permit the photographic treating liquid to (1) flow into the cavity through the liquid passage means when the lower end is lowered into the tank with the liquid level in the cavity corresponding to the desired liquid level in the tank, and (2) flow out of the cavity when the lower end is raised from the tank;

said lower end enclosure means having a lower end light baffle means associated with the passage means forming a lower end light trap for preventing the entrance of light into the cavity through the lower end wall means while permitting the flow of liquid into and out of the cavity through the liquid passage means;

an upper end enclosure wall means mounted to the upper end of the upright side wall enclosing the cavity at the upper end;

said upper end enclosure wall means having a fluid passage means formed therein to permit air to flow out of the cavity when the lower end is lowered into the tank and to permit air to flow into the cavity when the lower end is raised from the tank;

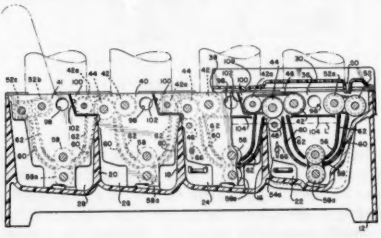
said upper end enclosure wall means having a light baffle means associated with the fluid passage means forming an upper end light trap for preventing the passage of light into the cavity while permitting the flow of air into and out of the cavity through the fluid passage means; said developing tank having an upright tank wall forming a recess for receiving the photographic treating liquid and film carrier in which the upright tank wall includes a lower wall section having a reduced cross-sectional area and an upper wall section having an enlarged cross-sectional area to form a liquid surge reservoir with an inclined wall section that extends inward and downward to the lower wall portion to guide the film carrier downward into the recess from the upper wall section to the lower wall section and to enable surges of treating liquid from the recess in the lower wall section to flow upward and expand gradually outward along the inclined wall portion to the liquid surge reservoir should the carrier be lowered into the recess too rapidly to thereby prevent the treating liquid from squirting from or overflowing from the recess.

4,291,969

PHOTOGRAPHIC DEVELOPER-PRINTER ASSEMBLY, AND A CONVEYING ROLLER UNIT THEREFOR

Gary E. Raymond, 755 Rainbow Dr., Hollywood, Fla. 33021

Filed Oct. 9, 1979, Ser. No. 82,652
Int. Cl.³ G03D *3/08*
U.S. Cl. 354—322 **13 Claims**



1. A photographic developer-printer assembly, comprising:

first means defining a reservoir;

partitions subdividing said reservoir into a plurality of tanks;

conveying roller assemblies replaceably disposed in said reservoir;

second means coupled to said first means, and engaged with said roller assemblies, for rotatably driving said roller assemblies; and

guide means disposed adjacent to said roller assemblies, for directing photographic papers, which are to be developed and printed, to said roller assemblies successively; wherein

said roller assemblies comprise a pair of spaced apart rollers, an intermediate roller interposed between said pair of rollers, and band means replaceably looped about said pair of rollers and atop said intermediate roller; and

said band means comprises a multitude of substantially parallel strands, closely spaced apart, lying normal to said rollers' axes of rotation, for constraining photographic papers which are directed to, and conveyed between said roller assemblies, firmly to said intermediate rollers; and further including

means engaged with said intermediate rollers for cleansing the latter of any substances borne on the surface thereof; wherein

said partitions subdivide said reservoir into a first developing-fluid tank, a second fixing-fluid tank, and a final water tank; further including

a pair of exit rollers, rotatably supported in said final tank and coupled to said second means to be driven thereby, for nipping photographic papers and removing the latter from said final tank; and

chamber means supported on said first means, adjacent to said exit rollers, in which to collect papers exiting from said final tank; and wherein

said chamber means comprises rack means on which slidably to receive papers exiting said final tank and moving into said chamber means for collection therein; and

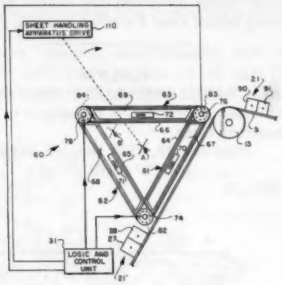
said rack means comprises means for inhibiting surface tension attraction of papers slidably received thereon.

4,291,970

APPARATUS FOR PRODUCING DUPLEX COPIES

Alphonse B. DiFrancesco, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1979, Ser. No. 98,572
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **9 Claims**



1. In apparatus for producing images on first and second sides of a copy sheet and including a movable image transfer member upon which first and second unfixed transferable images may be formed, copy sheet handling means comprising:

a vacuum member movable in opposite directions, and

means for moving said vacuum member between

(a) a first position overlying said image transfer member and at which said vacuum member is moved in synchronism with the image transfer member in one direction to separate by vacuum attraction a copy sheet to one side of which a first transferable image has been transferred from said transfer member, and

(b) a second position, spaced from the first position, and to which the vacuum member is moved after separation of the copy sheet from said transfer member, said vacuum member being moved in the opposite direction in synchronism with the image transfer member when in said second position to bring the second side of the copy sheet into transferable relationship with the second transferable image on the transfer member.

4,291,971

ELECTROGRAPHIC PHOTOCOMPOSING MACHINE

Igor V. Anfilov, ulitsa Udaltsova, 12, kv. 136, Moscow; Geny S. Ershov, prospekt Energetikov, 46, korpus 1, kv. 72; Eduard A. Kaidoshko, prospekt Lunacharskogo, 68, korpus 2, kv. 82, both of Leningrad; Jury B. Remizov, ulitsa Zelenogradskaya, 21, korpus 2, kv. 193; Anatoly L. Rozhenko, ulitsa Lavochkina, 6, korpus 2, kv. 215, both of Moscow; Gennady P. Suvorov, prospekt K.Marxa, 70, kv. 81, Leningrad, and Boris G. Scherbatenko, Leninsky prospekt, 92, kv. 121, Moscow, all of U.S.S.R.

Filed Sep. 4, 1979, Ser. No. 72,556
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **1 Claim**

1. An electrographic photocomposing machine comprising:

a rotary type carrier with negative images of characters;

a flashtube of said rotary type carrier, generating a beam and having a control unit;

a photographic unit arranged downstream of said rotary type carrier along the beam from said flashtube and having a drive;

a line forming mechanism arranged downstream of said photographic unit along the beam from said flashtube;

an electrophotographic section arranged downstream of said line forming mechanism along the beam from said flashtube;

a cylindrical intermediate image carrier optically associated with said line forming mechanism and having a drive;

a photoconductive layer of said intermediate image carrier;

a dielectric layer of said intermediate image carrier, applied on said photoconductive layer and transparent in the sensitive area of said photoconductive layer;

a computer unit electrically associated with said drive of said line forming mechanism, with said control unit of said flashtube, and with said drive of said intermediate image carrier;

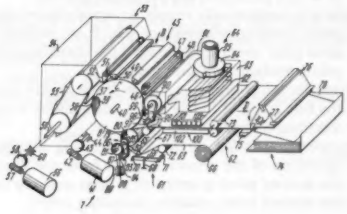
a charging device of said electrophotographic section, arranged in proximity to said intermediate image carrier;

a first charger of said charging device, arranged in direct proximity to said intermediate image carrier;

a first lamp of said charging device, for exposure of said intermediate image carrier, illuminating a portion of said intermediate image carrier in the area of action of said first charger;

a second charger of said charging device, arranged at a distance from said first charger in the direction of rotation of said intermediate image carrier, in direct proximity thereto;

a third charger of said charging device, arranged at a distance from said second charger in the direction of rotation of said intermediate image carrier, in direct proximity thereto, the luminous flux which carries the image of said characters from said type carrier projecting said characters on the portion of said intermediate image carrier between said second and third chargers;



a second lamp for exposure of said intermediate image carrier, arranged downstream of said third charger in the direction of rotation of said intermediate image carrier;

a latent image developing device of said electrophotographic section contiguous with the surface of said intermediate image carrier and arranged in the direction of its rotation downstream of said charging device;

a powder image transferring device of said electrophotographic section, provided with a paper feed system including a paper web with a powder image applied on its first side, wherein said powder image transferring device ensures mechanical contact between said paper web and said intermediate image carrier and is arranged downstream of said latent image developing device in the direction of rotation of said intermediate image carrier;

a device for cleaning said intermediate image carrier of said electrophotographic section, arranged downstream of said powder image transferring device in the direction of rotation of said intermediate image carrier;

a unit of said electrophotographic section for fixing the powder image on the paper; and

heaters of said unit of said electrophotographic section for fusing the powder image into the paper, arranged near said paper web on its first side, downstream of said powder image transferring device in the direction of motion of said paper web.

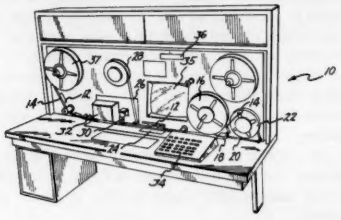
4,291,972
PHOTOGRAPHIC REPRINT SYSTEM WITH LARGE PRINT QUANTITY VERIFICATION

Ronald C. Laska, Minnetonka, and Janis Pone, Minneapolis, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 23,521, Mar. 23, 1979, abandoned. This application Jan. 7, 1980, Ser. No. 109,821

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—40 **20 Claims**



1. A photographic printer for printing photographic prints from photographic film frames, the photographic printer comprising:

means for storing print quantity information indicative of desired print quantity for each of a plurality of film frames;

means for sequentially advancing the film frames to a print gate at which photographic prints are printed;

means for sequentially supplying signals based upon the stored print quantity information, which are indicative of the desired print quantity to be used in controlling the quantity of prints made from a film frame;

means for interrupting operation of the printer prior to printing the film frame if the desired print quantity exceeds a predetermined number; and

operator-controlled means for providing signals to reinitiate operation of the printer to print from the film frame either the desired print quantity or a print quantity different from the desired print quantity, including zero.

4,291,973
SCANNING SYSTEM

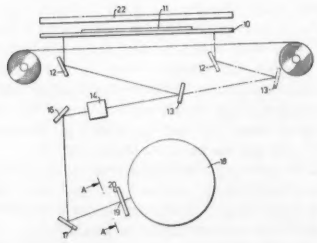
Edric R. Brooke, Bishops Stortford, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 19, 1979, Ser. No. 105,369

Claims priority, application United Kingdom, Dec. 21, 1978, 49533/78

Int. Cl.³ G03B *27/72*

U.S. Cl. 355—71 **7 Claims**



1. An optical scanning system for a copier comprising

at least one stationary illumination source for illuminating a document lying in an object plane,

at least one scanning mirror adapted for movement in a plane parallel to said object plane,

at least one flexible belt adapted for movement in a plane parallel to and located between said object plane and said scanning mirror plane, said flexible belt having at least one elongated window extending across its width, the movement of said mirror and said web being synchronized so that light incrementally reflected from said document is transmitted through said window to said mirror thereby effecting line by line scanning of said document, and

projection means for projecting images reflected by said scanning mirror onto a moving imaging plane.

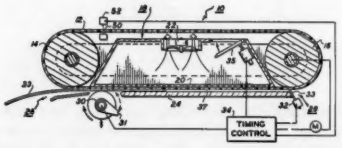
4,291,974
DUAL MODE DOCUMENT BELT SYSTEM

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1980, Ser. No. 111,063

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—76 **7 Claims**



1. In a document handling system for a copier for documents to be copied at an exposure station of a copier in a first copying mode in which the documents are transported to the exposure station by a moving endless vacuum belt transport with a substantial area of vacuum apertures in said vacuum belt providing vacuum attraction of said documents, and in a second copying mode in which documents are manually placed at the exposure station and said vacuum belt is stationarily placed thereover; and wherein said document belt has a light reflective surface to provide an optical background for the documents to be copied at said exposure station in both said copying modes, the improvement comprising:

providing at least one completely unapertured area of said belt which is larger than the area of said exposure station, said unapertured area being spaced between apertured areas of said belt circumferentially along said surface of said belt in the direction of motion of said belt, and wherein said light reflective surface of said belt throughout said unapertured area is a single optically uniform surface; and

belt registration means for automatically positioning and stopping said belt in a first stopping position in which said unapertured area thereof is fully overlying said exposure station when said document handling system is in said second, manual document placement, mode of operation so that none of said vacuum apertures are exposed for copying in said exposure station.

4,291,975
APPARATUS FOR DETERMINING THE COLOR CHARACTERISTICS OF A GEM

Paul M. Raccah, Chicago, Ill., assignor to Scientific Gem Identification, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 81,363, Oct. 3, 1979, abandoned, which is a continuation of Ser. No. 916,120, Jun. 16, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 113,777

Int. Cl.³ G01N *21/27*

U.S. Cl. 356—30 **27 Claims**

1. Apparatus for measuring the spectral transmission characteristics of a gem, comprising:

a source of polychromatic light;

means for supporting the gem in a position to receive a portion of the light from said light source, said light being

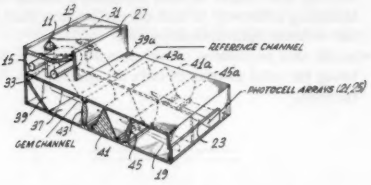
transmitted by the gem in accordance with the spectral transmission characteristics of the gem;

first and second, corresponding arrays of phototransducers;

optical means for defining a gem channel optical path and a reference channel optical path, said optical means including

first means for collecting light transmitted by the gem to form a gem channel beam of light for transmission along the gem channel optical path to said first array of phototransducers,

second means, operable simultaneously with said first means, for collecting a portion of the light from said light source to form a reference channel beam of light



for transmission along the reference channel optical path to said second array of phototransducers, and

means for separating each of the gem channel and reference channel beams of light into a plurality of separate wavelength bands, and for directing the light in each wavelength band at a separate phototransducer in the corresponding array of phototransducers, whereby a plurality of corresponding light intensity measurements are produced by each array; and

means for comparing each light intensity measurement from said first array with the corresponding light intensity measurement from said second array, to produce a plurality of normalized measurements representative of the spectral transmission characteristics of the gem.

4,291,976

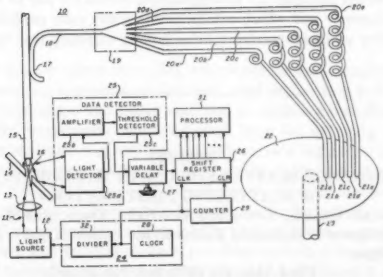
DIGITAL FIBER OPTIC POSITION SENSOR

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 10, 1980, Ser. No. 128,614

Int. Cl.³ G01D *5/34*

U.S. Cl. 356—150 **7 Claims**



1. An optical digital position sensor comprising:

main optical transmission means for propagating incident and reflected optical signals having a first terminal adapted to receive and to transmit optical signals;

branch optical transmission means coupled to receive said incident optical signals from said main optical transmission means for propagating said received optical signals and reflected optical signals thereof to provide differential optical signal round trip time delays between said first terminal and end terminals of said branch optical transmission means; and

code means having areas with a first reflection coefficient and areas with a second reflection coefficient, said areas illuminated by optical signals received from said main optical transmission means and emitted from said end terminals, each area thereafter returning an optical signal in accordance with the reflection coefficient positioned thereat to said branch optical transmission means wherefrom said reflected signals are coupled to said main optical transmission means to propagate to said first terminal thereby establishing a time sequence of optical signals thereat coded in accordance with said first and second reflection coefficients illuminated by said optical signals emitted from said end terminals.

4,291,977

ADJUSTMENT DEVICE FOR ALIGNING A GROUP OF CYCLICALLY SWITCHED LIGHT TRANSMITTERS OR RECEIVERS WITH A SINGLE LIGHT RECEIVER OR TRANSMITTER

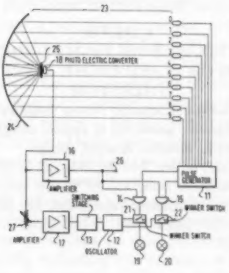
Jürgen Erdmann, and Walter von Stein, both of Waldkirch, Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed May 24, 1979, Ser. No. 41,993

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 2824311

Int. Cl.³ G01B *11/26*

U.S. Cl. 356—152 **13 Claims**

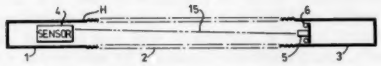


9. An adjustment device for aligning a transmitter with a receiver, the adjustment device comprising means for passing output signals from said receiver and signals representative of the operation of said transmitter to coincidence circuit means adapted to produce an output indicative of coincidence between the operation of said transmitter and the generation of output signals at said receiver, adjustment indicating means adapted to receive said output from said coincidence means to produce an adjustment indicating signal, a first threshold circuit having a first threshold value adapted to pass only signals lying above said first threshold value from said receiver to said adjustment indicating means, means for passing said output signals to a second threshold circuit having a second threshold value greater than said first threshold value and adapted to produce, via associated circuit means, periodic variation of the signal from said adjustment indicating means when said output signals lie below said second threshold.

4,291,978
APPARATUS FOR AUTOMATICALLY DETERMINING THE POSITION AT WHICH A BEAM OF LIGHT IMPINGES ON A TARGET

Harold O. Seigel, Don Mills, Canada, assignor to Scintrex Limited, Don Mills, Canada

Filed Dec. 5, 1979, Ser. No. 100,478
Int. Cl.³ G01B *11/26;* **E21B** *25/16*
U.S. Cl. 356—152 **14 Claims**

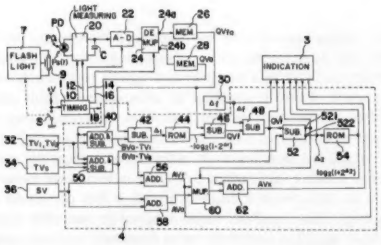


1. Apparatus for determining the position at which a beam of light impinges on a target comprising a light source providing a collimated beam of light; a rotatable target spaced apart from said light source and having a surface on which said collimated beam of light impinges, a part of said surface comprising photoelectric material extending outwardly from the axis of rotation of said target towards the periphery of said target, said photoelectric material being so shaped that the angle it subtends at said axis of rotation at any distance therefrom is a function of said distance; means for rotating said target; means including gravity responsive means for providing a first electrical signal having a waveform that establishes a reference direction for any point on said surface of said target; means for deriving from said photoelectric material a second electrical signal during rotation of said target, said second electrical signal containing information with respect to the spacing between said axis of rotation and the position at which said beam of light impinges on said target as well as the angular orientation of said position with respect to said reference direction; and signal processing means for translating said first and second electrical signals to provide an output signal that determines the position at which said beam of light impinges on said target.

4,291,979
DEVICE FOR MEASURING LIGHT UNDER AMBIENT LIGHT AND/OR FLASH LIGHT AND A METHOD THEREFOR

Yoshio Yuasa, Kawachinagano; Norio Ishikawa, Osaka, and Nobuyuki Taniguchi, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Continuation-in-part of Ser. No. 56,191, Jul. 9, 1979, abandoned. This application Nov. 16, 1979, Ser. No. 94,922
Claims priority, application Japan, Jul. 10, 1978, 53-84278
Int. Cl.³ G01J *1/42, 1/46;* **G03B** *7/08*
U.S. Cl. 356—218 **44 Claims**



1. Light measuring means for use in flash photgraphy, which measures a preliminary flash light to obtain camera exposure information for photography under a primary flash light, comprising:

means for receiving light;

means for producing an output in response to said light receiving means;

first means for integrating the output of said producing means during a first predetermined period of time including at least the duration time of the preliminary flashing to obtain a first signal;

means for obtaining a second signal including light intensity information without the influence of the preliminary flash light, by utilizing the output of the producing means; and

means for processing at least said first and second signals to obtain camera exposure information for photography under the primary flash light;

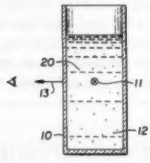
wherein said producing means comprises means for transmitting said output to said integrating means in a form including influences of both the preliminary flash light and the ambient light intensities; and

wherein said processing means comprises means for calculating the total amount of only the preliminary flash light received.

4,291,980
STYRENE-DIVINYLBENZENE COPOLYMER AND METHOD OF MANUFACTURE

James A. Patterson, Los Altos, Calif., assignor to Amco Standards International, Mountain View, Calif.

Filed Aug. 14, 1978, Ser. No. 933,140
Int. Cl.³ G01J *1/02*
U.S. Cl. 356—243 **6 Claims**



1. A suspension for measuring the turbidity of water comprising a suspension of substantially spherical particles in substantially turbidity-free water, said particles comprising substantially pure styrene-divinylbenzene copolymer wherein said spherical particles are substantially between 0.2 μm to 1.0 μm in diameter and which exhibit substantially pure particle light scatter when suspended is substantially turbidity-free water.

4,291,981
REFERENCE SCATTER FOR USE IN THE CORRECTION OF SCATTERING PHOTOMETERS

Masaaki Ohnishi, Settsu, and Akio Saito, Kyoto, both of Japan, assignors to Kabushiki Kaisha Kyoto Daiichi Kagaku, Kyoto, Japan

Filed Mar. 23, 1979, Ser. No. 23,407
Claims priority, application Japan, Apr. 5, 1978, 53-40685
Int. Cl.³ G01N *21/15*
U.S. Cl. 356—244 **11 Claims**

1. A reference scatterer for use in the correction of scattering photometers comprising: a reference glass scatterer main body containing microcrystals for phase splitting incident light; a transparent vessel; a cap for said transparent vessel having means for coupling said reference glass scatter main body to said transparent vessel with a clearance between said

body and said vessel; said body placed within said vessel with a clearance therebetween, and a liquid which fills the clearance

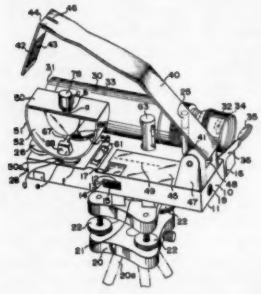
and is prevented from leaking out of the transparent vessel by said cap.

4,291,982

MULTI-PURPOSE SURVEYING INSTRUMENT

Hsii S. Chin, No. 84, Lane 27, Yi Chiao St., Jia Yi, Taiwan

Filed Apr. 19, 1979, Ser. No. 31,474
Int. Cl.³ G01C *9/18*
U.S. Cl. 356—249 **8 Claims**



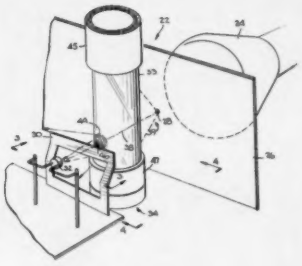
1. A multi-purpose surveying instrument for use in engineering surveying in general architecture, civil engineering and the like comprising a horizontal base, and an adjusting base that is provided underneath said horizontal base for adjusting the level or inclination of said horizontal base, said horizontal base having thereon a plurality of instruments including a telescope, a sight pole, a plane mirror, a vertical scale, a horizontal scale, and a plurality of level tubes disposed vertically and horizontally; the horizontal base having a flat and level bottom surface on which a cylindrical recess is provided with its axis vertical to said bottom surface, the horizontal scale being placed in said cylindrical recess with an axle, the telescope being fixed horizontally on the upper surface of the horizontal base, the sight pole having one end pivotally connected to the the horizontal base, the plane mirror being bonded horizontally to the upper surface of the horizontal base, the vertical scale being mounted on the horizontal base with a swivel axis perpendicular to the bottom surface of the horizontal base, said vertical scale being capable of rotating about said swivel axis.

4,291,983

PHOTOMETRIC APPARATUS AND METHOD

Thomas L. Kraft; Howard A. Vick, and James W. Meador, all of Houston, Tex., assignors to American Home Products Corporation, New York, N.Y.

Filed May 22, 1979, Ser. No. 41,475
Int. Cl.³ G01N *21/51, 15/06*
U.S. Cl. 356—338 **11 Claims**



1. Nephelometer apparatus for analyzing a fluid sample of particulate material disposed in a container comprising:

light source means for projecting light about an optical axis, the projected light diverging from the optical axis;

photoelectric means spaced from the light source means and disposed on or adjacent said optical axis for receiving light from the light source means, the electrical characteristic of the photoelectric means being dependent upon the intensity of light received by the photoelectric means;

means for positioning the container at a predetermined location intersecting the diverging projected light and spaced apart from the light source means and the photoelectric means;

first baffle means opaque to the light from the light source means disposed adjacent one of the opposite sides of the positioning means and intersecting said optical axis and extending therefrom for preventing light in a first predetermined region extending about the optical axis and including any direct image of the light source means from reaching the photoelectric means while permitting light emerging from the container in the positioning means in a second predetermined region extending beyond said first predetermined region to reach the photoelectric means;

the light source means being operative to project light diverging sufficiently from the optical axis to illuminate particulate material positioned in said container to redirect said illuminating light directly into said second predetermined region to reach said photoelectric means; and

indicator means coupled to said photoelectric means for proportionally indicating the intensity of the light receiving by the photoelectric means in accordance with the electrical characteristics of the photoelectric means.

4,291,984

OPTICAL AMPLIFICATION FOR THE FIBER INTERFEROMETER GYRO

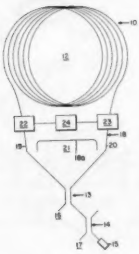
Donald J. Albares, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1979, Ser. No. 95,868
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—350 **3 Claims**

1. In a pulsed fiber interferometer gyro having a single external laser projecting clockwise and counterclockwise pulsed energy bidirectionally through a single mode fiber coiled about an identical area a plurality of times and a length of single mode optical fibers reaching between a pair of beam-splitter/couplers coupled to the coiled single mode fiber for

encompassing a negligible area as compared to the identical area, an improvement therefor is provided comprising:

a first and a second means optically coupled to the coiled single mode fiber each between one of the beamsplitter/-couplers and the coiled single mode fiber for amplifying the bidirectionally projected clockwise and counterclockwise pulsed energy to provide for greater interferometer



sensitivity by increasing the strength of the projected bidirectional energy to allow the single mode fiber to be of greater length and

means coupled to the first and second amplifying means for pulse actuating the first and second amplifying means when clockwise and counterclockwise pulses of energy arrive thereat.

4,291,985

DUAL BEAM PHOTOMETER WITH ROTATING FILTER PLATE

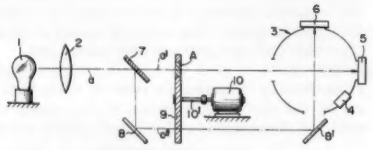
Masatoshi Tsujimura, Fujimi, Japan, assignor to Nippon Denshoku Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 118,307

Claims priority, application Japan, Apr. 17, 1979, 54-47542

Int. Cl.³ G01N *21/27;* G01J *3/50*

U.S. Cl. 356—408 **6 Claims**



1. A photometer comprising

a light source,

a rotating plate provided with a plurality of filter means having different wave lengths,

a reference plate and a sample means, said rotating plate disposed between said light source and said reference plate and sample means, and

a half-mirror and a reflection plate located between said light source and said rotating plate, said half-mirror and reflection plate being disposed so as to form a first light passage adapted to extend to the reference plate, and a second light passage adapted to extend to the sample means, whereby alternate radiation through one of said filter means against the reference plate and the sample means is made by the rotation of said rotary plate.

4,291,986

OPTICAL RATE ASSAY APPARATUS

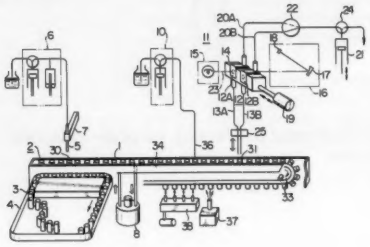
Takehide Satou, Katsuta; Kasumi Yoshida, Mito; Hisayuki Sagusa, Katsuta; Osamu Ohno, Katsuta, and Tetuaki Abe, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1979, Ser. No. 62,115

Claims priority, application Japan, Dec. 14, 1978, 53-153657

Int. Cl.³ G01N *21/85*

U.S. Cl. 356—410 **10 Claims**



1. An apparatus for an optical rate assay comprising:

a train of vessels each containing a sample solution whose optical characteristic is to be measured;

a plurality of flow cells;

optical unit means for observing changes in light absorbance of a sample solution in one of said flow cells placed in an optical path;

means for maintaining said respective flow cells at a predetermined temperature while the respective flow cell is placed not only in said optical path but also out of said optical path;

means for selectively introducing, during a period when a sample solution introduced from a specified one of said vessels into a specified one of said flow cells is held in said specified flow cell, a sample solution in a next one of said vessels into a different one of said flow cells;

means for placing said different one of said flow cells at a location out of said optical path when the sample solution is introduced into said different one of said flow cells, and for bringing said different flow cell into said optical path after the sample solution contained in said different flow cell has reached a predetermined temperature by replacing said specified flow cell by said different flow cell;

optical unit means for observing changes in absorbance of said sample solution in said different flow cell by irradiating said sample solution in said different flow cell with light, after changes in absorbance of said sample solution in said specified flow cell has been observed; and

means for displaying results of observation corresponding to the respective absorbance changes of said sample solutions in said respective flow cells.

4,291,987

HOLE SEEKING APPARATUS

Erwin Sick, Icking, and Siegfried Mankel, Geretsried, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH, Optik-Elektronik, Fed. Rep. of Germany

Filed Jan. 23, 1980, Ser. No. 114,591

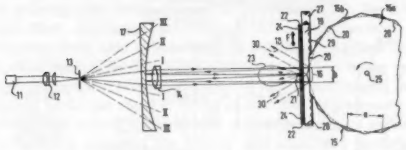
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1979, 2904435

Int. Cl.³ G01N *21/89;* G02B *27/17*

U.S. Cl. 356—431 **8 Claims**

1. Hole seeking apparatus for detecting holes in material webs using optical beam scanning apparatus for cyclically scanning a light bead across a material web from one margin to the other, and a light receiving device disposed behind the web for detecting light transmitted through holes therein, said optical beam scanning apparatus comprising a light source, preferably in the form of a laser, a microobjective, a slot aper-

ture on which light from said light source is concentrated by said laser, first and second substantially identically constructed mirror wheels rotatable about a common axis and having multiple facets, said first and second mirror wheels lying coaxially adjacent one another and being displaced by a half pitch of one facet relative to one another, an objective for directing light from said slot aperture towards said axis of rotation onto said facets to form a patch of light thereon and a strip-like concave mirror with its focus coincident with said patch of light to direct light reflected from said first and second mirror



wheels onto said material web to form said light bead, with the width of said patch of light in the peripheral direction of the first and second mirror wheels being less than one half the peripheral length of a said facet and such that edges between the facets of the first and second mirror wheels first enter the patch of light when the light bead on the web is at a distance from the margin of the web such that light scattered from a said edge within the scattering lobe of the edge can no longer be reflected from said concave mirror past a margin of the material web.

4,291,988

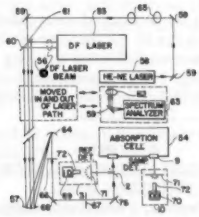
AUTOMATED PATH DIFFERENCING SYSTEM

Richard G. Dixon, Jr., Las Cruces, N. Mex., and Wendell R. Watkins, El Paso, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 907,653, May 22, 197P ibandoned. This application Jun. 30, 1980, Ser. No. ,206

Int. Cl.³ G01N *21/01*

U.S. Cl. 356—437 **7 Claims**



1. In a system for measuring absorption coefficients of atmospheric constituents, apparatus comprising:

an absorption cell having first, second and third spherically concave mirrors positioned such that reflections from said first mirror are reflected at one point by said second mirror to be reflected thereon at another point by said third mirror, said first and third mirrors being positioned at the far end of said cell and said second mirror being positioned at the near end of said cell, said cell including first and second windows spaced along said near end;

first means at said near end for supplying a cylindrical hollow center input beam of coherent optical energy through said first window towards said first mirror;

second means providing a reference beam of coherent optical energy through said first window;

adjustable means at said near end for adjustably aligning said reference beam to pass through said hollow center of said input beam, said adjustable means including an apertured mirror, said hollow center of said input beam being aligned with the aperture in said mirror and said reference beam passing through said aperture;

means adjacent said near end first window for detecting the alignment of said reference beam through said hollow center of said input beam;

a third window at said far end for observing reflection images on said second mirror;

means at said far end for adjusting the positioning of said first and third mirrors, the positioning of said third mirror providing rapid changes in the path length in the absorption cell between short and long multipaths;

output means adjacent said near end second window for detecting and measuring the reflected images from said third mirror passing through said second window; and

means at said near end for remotely controlling the positioning of said first and third mirrors at said far end.

4,291,989

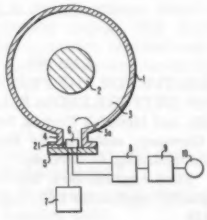
ABNORMALITY SENSING DEVICE FOR GAS-INSULATED ELECTRIC APPARATUS

Yoshiaki Ida; Shiro Fukuda, and Osayoshi Imamura, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,328

Int. Cl.³ G01N *21/17*

U.S. Cl. 356—440 **2 Claims**



1. An abnormality sensing device for gas-insulated equipment of the type including electrical apparatus disposed within a hermetically sealed, insulated-gas-containing container, said abnormality sensing device comprising:

a light emitting element and a light receiving element disposed within said container opposite each other, said light receiving element positioned so as to receive the light emitted by said light emitting element; and

means for comparing the quantity of light emitted by said light emitting element with the quantity of light received by said light receiving element to sense a change in the quantity of light received by said light receiving element.

4,291,990

APPARATUS FOR MEASURING THE DISTRIBUTION OF IRREGULARITIES ON A MIRROR SURFACE

Shinichiro Takasu, Tokyo, Japan, assignor to VLSI Technology Research Association, Japan

Filed Jan. 22, 1979, Ser. No. 5,199

Claims priority, application Japan, Jan. 27, 1978, 53-8086

Int. Cl.³ G01N *21/55;* G01B *11/30, 9/02;* G01N *21/00*

U.S. Cl. 356—445 **14 Claims**

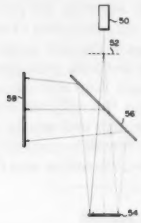
1. An apparatus for measuring the distribution of extensive and local irregularities on a mirror surface comprising:

light generating means for irradiating a coherent light flux onto said mirror surface;

light dividing means, positioned between said light generating means and said mirror surface, for dividing the light flux irradiated from said light generating means into a plurality of first light fluxes, arranged in a prescribed lattice form to cover said mirror surface, for measuring

extensive irregularities on said mirror surface and a plurality of second light fluxes, surrounding each of the first light fluxes but not overlapping or coinciding with each other, for measuring the distribution of local irregularities on the surface; and

means for receiving light fluxes reflected from the mirror



surface and for permitting the inspection of the pattern of reflections, whereby the distribution of extensive irregularities on the mirror surface are determined through the inspection of the pattern of reflections of the first light fluxes and the distribution of local irregularities on the mirror surface are determined through the inspection of the pattern of reflections from the second light fluxes.

4,291,991

APPARATUS FOR THE PREPARATION OF A REACTION MIXTURE FROM FLUID COMPONENTS

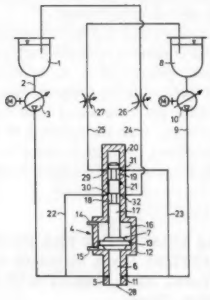
Klaus Schulte, and Heinrich Ersfeld, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,748

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837424

Int. Cl.³ B01F *15/00;* **G05D** *16/00*

U.S. Cl. 366—159 **6 Claims**



1. Apparatus for the preparation of a reaction mixture, from fluid components, comprising storage tanks, feed pipes leading from said storage tanks to a mixing head via metering pumps and opening into a mixing chamber via injection apertures, said mixing chamber formed by the bore of a housing, a control piston displaceable within said bore and being capable of blocking flow through said apertures, return lines branching off upstream of said apertures and leading up to said storage tanks, and a shut-off means for stopping the flow of said material through at least one of said return lines, the activation of said shut-off means being dependent upon the position of said control piston within said bore.

4,291,992

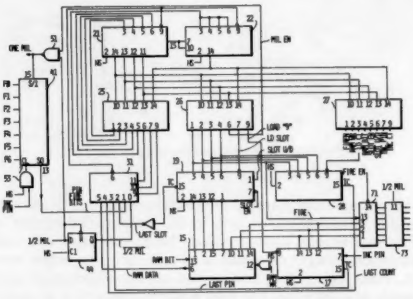
PRINTER PIN CONTROL CIRCUITRY

Charles W. Barr, Nashua; Michael I. Lerer, Bedford; Royden C. Sanders, Jr., Wilton, and Russell J. Vassar, Jr., Nashua, all of N.H., assignors to R. C. Sanders Technology Systems, Inc., Amherst, N.H.

Filed May 22, 1979, Ser. No. 41,415

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **7 Claims**



1. In a printer system employing a multiple pin print head in which pin firings are initiated by the generation of data words at a clock rate substantially faster than possible repetitive firings of a single pin, each such word comprising a plurality of data bits each corresponding to a respective pin, the occurrence of a fire bit at any data bit position in the data word being a signal to initiate an operation of the respective pin; apparatus for effecting high speed actuation and damping of the pins in response to such data words, said apparatus comprising:

for each pin, a high speed driver circuit;

means for generating, for each pin, a firing signal which comprises a long pulse of predetermined duration, initiated by a respective fire bit, followed by a series of short pulses;

means for applying each firing signal to the respective driver circuit; and

means for reducing the number of short pulses in the series when a successive fire bit for the same pin is received in a predetermined interval following the long pulse, the extent of shortening being a predetermined progressive function of the actual timing of said successive fire bit.

4,291,993

DEVICE FOR INSTALLING AND SECURING A PRINTING DISC

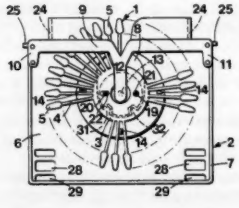
Gustave Gagnebin, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Filed Dec. 3, 1979, Ser. No. 99,721

Claims priority, application Switzerland, Dec. 20, 1978, 12926/78

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 **8 Claims**



1. A device for installing and securing a printing disc having

radial arms on a driving plate secured to a selecting shaft of a typewriter having a carriage with a card press with folded over borders, the driving plate having angular locating means adapted to cooperate with the hub of the printing disc; comprising a support for the printing disc, retaining members in the form of projections on the support adapted to extend between the radial arms for retaining the disc in a single relative position, and guide and abutment means for defining an engagement position of the support in the typewriter in which the hub of the printing disc is substantially opposite the driving plate, the printing disc being adapted to cooperate with the driving plate after a displacement of the support in the direction of the selecting shaft, said support having an elastic member biasing the disc against the retaining members, the disc being spaced apart from the retaining members when it is engaged on the driving plate, the support being constituted by a support plate having projections forming said retaining members and a central opening opposite the hub of said disc, said guiding and abutment means being constituted by slots in the upper ends of the folded over borders of said card press, these borders forming two lateral guides for the support and each slot forming an abutment, bosses secured to said support engageable with said abutments, the support being adapted to be introduced transversely to the selecting shaft between the two borders, then pivoted in the direction of the selecting shaft around an axis passing through the two bosses.

4,291,994

TEAR RESISTANT RIBBON FOR NON-IMPACT PRINTING

Thor L. Smith, Los Altos Hill, and William J. Weiche, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,375
Int. Cl.³ B41J *31/02*
U.S. Cl. 400—241.1 **6 Claims**

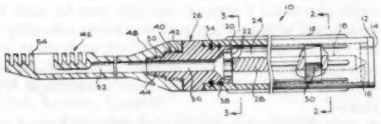
1. A ribbon for non-impact printing comprising a transfer layer and a substrate which is a mixture of resin comprising from about 90% to about 50% by weight of polycarbonate and from about 10% to about 50% by weight of a block copolymer of bis-phenol A and dimethyl siloxane and based upon the total weight of the resin mixture from about 15% to about 40% by weight of electrically conductive carbon black.

4,291,995

TOOTHBRUSH WITH RE-FILLABLE PASTE RESERVOIR

Joseph K. Dikoff, St. Croix, V.I., assignor to Elizabeth A. Tasis, Ft. Lauderdale, Fla.

Filed Jan. 8, 1980, Ser. No. 110,401
Int. Cl.³ A46B *11/02*
U.S. Cl. 401—175 **9 Claims**



1. A paste-dispensing toothbrush with a refillable reservoir, including:

a brush head, said brush head having a first connector portion and a bristle portion, said first connector portion having female threads of a first size and including a channel intercoupling said bristle portion with said connector portion;

a reservoir of variable volume, said reservoir including a hollow, cylindrical body portion having inner and outer walls and having an end-cap at one extremity thereof, said inner wall having a shape other than a circular shape;

a spout portion rotatably and coaxially connected to said body portion at the remaining extremity of said body portion, said spout portion having a second connector portion at the end thereof opposite that connected to said body portion, said second connector portion including a first section of a first diameter and a second section of a second diameter, both said first and second sections carrying male threads, said male threads on said first section being sized and shaped to cooperate with said female threads in said first connector portion of said brush head; said first diameter being larger than said second diameter and said second section being more remote from said end cap than said first section, said second diameter being sized to cause an interference fit of said second section with the inner wall of the nozzle of a toothpaste tube;

said spout portion having a coaxial channel therethrough aligned with said channel in said brush head when said brush head is in position on said spout portion;

an aperture plate, having apertures therethrough, supported fixedly and coaxially in said spout portion and transverse to and spanning the channel through said spout portion;

a threaded rod fixedly supported at its one end in said aperture plate and rotatably supported at its other end in said end cap in coaxial relationship with said body portion; and,

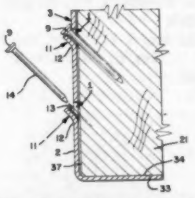
a piston having a peripheral shape corresponding to the shape of the inner wall of said body portion and dimensioned to fit slidably within said body portion in transverse relationship to said body portion and coaxial therewith, said piston having a central opening therein sized and threaded to operatively engage said threaded rod, whereby, upon relative rotation between said spout portion and said body portion said piston moves axially along said threaded rod.

4,291,996

POSITIVE NAIL ANGLING DEVICE FOR METAL CONNECTORS

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Jul. 1, 1980, Ser. No. 165,202
Int. Cl.³ F16B *9/00*
U.S. Cl. 403—14 **4 Claims**



1. A positive nail-angling device for positioning a nail with respect to the face of a metal connector and a structural wood member only at a preselected angle which is substantially less than 90° comprising:

a. said metal connector is a metal hanger having parallel side members and a seat for holding a held wood member in relation to an attachment member;

b. said positive nail angling device is formed in one or more of said sides of said metal hanger;

c. a slot-like opening formed in a face of said connector having a length greater than its width wherein said width is selected to register with the sides of said nails;

d. a tab-like member formed from the displaced face material from said slot-opening and bent along a bend line which constitutes one end of said slot-like opening;

e. said tab-like member is formed with a nail receiving surface for positively receiving a side of said nail in generally parallel, face-to-face relationship; and

f. the length of said slot-like opening is selected to receive

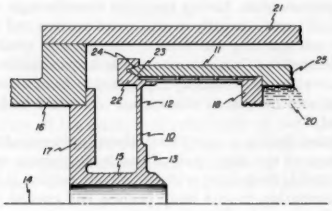
said nail only at a pre-selected angle in relation to the face of said metal connector so that one side of the shank of said nail is in touching or close fitting relation to one end of said slot-like opening and the opposite side of said nail shank is in touching or close fitting relation to said nail receiving surface of said tab-like member.

4,291,997

FLEXIBLE SUPPORT FOR SUPERCONDUCTING MACHINE ROTOR

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,791
Int. Cl.[2] H02K 9/00
U.S. Cl. 403—24 **10 Claims**



1. In a superconducting electrical machine including a rotor containing a torque tube therein, a support for said torque tube, said support comprising:

a cylindrical torsion shaft having its cylindrical surface centered about an axis and adapted to rotate thereabout; and

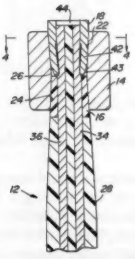
an axially flexible, radially stiff diaphragm affixed radially about said torsion shaft, said diaphragm being interfitted so as to be attached at its distal boundary to said torque tube and being free to exhibit axial movement thereat.

4,291,998

REPLACEMENT HANDLE FOR A TOOL

Gerard R. Santos, Levittown, Pa., assignor to The Budd Company, Troy, Mich.

Filed Jun. 5, 1980, Ser. No. 156,764
Int. Cl.[3] B25G 3/24
U.S. Cl. 403—263 **10 Claims**



1. A handle for a tool having an opening therein with top and bottom inwardly extending tapered portions from both ends so that the narrower part is located close to the center of the tool,

said handle comprising:

(a) a plastic strip;

(b) said plastic strip including a top tapered portion adjacent one end having a tapered direction corresponding to the taper direction of the top tapered portion in said tool;

(c) said top tapered section of said strip being spaced from the top tapered portion of said tool;

(d) an adapter element disposed to slide over the top of said handle around said top section of said strip,

(e) said adapter element including a tapered area to receive the bottom tapered portion of said tool;

(f) a metal insert having an opening therein dimensioned to fit over said top section of said strip in the space between the top tapered section of said strip and the top tapered portion of said tool; and

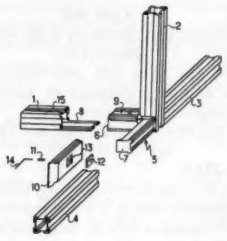
(g) said metal insert including bottom sections disposed to bend inwardly when said metallic insert is forced downwardly into said space to secure said tool to said handle.

4,291,999

DEVICE FOR THE ASSEMBLING OF A PLURALITY OF CONVERGING TUBULAR BARS

Pierre Vandelanoite, 5/6 Rue Mercier, Lys-les-Lannoy, France (59390)

Filed Sep. 21, 1979, Ser. No. 77,829
Claims priority, application France, Sep. 22, 1978, 78 27721
Int. Cl.[3] F16B 7/04
U.S. Cl. 403—297 **6 Claims**



1. In a device for the uncoupling connection of a plurality of convergent tubes by means of a star-shaped central core with branches which fit into ends of the tubes, each of the branches having means for clamping by expansion in said tubes, the ends of the tubes being shaped to fit against each other in such manner as to completely cover the central core, access being however provided to act on the clamping means of each branch, the improvement comprising in combination

two means for locking said tubes around all possible axes of oscillation, whatever the intensity of the clamping, comprising

said means for clamping by expansion comprising two parts comprising a first part constituting said branches being and integral one-piece part of the central core and the other part being a separate movable part for each branch juxtaposed with said first part, and screw clamping means for moving said two parts apart from each other, each of said two parts having two exterior lateral oblique bearing surfaces together forming four cornermost regions thereof,

said ends of the tubes having four interior lateral oblique bearing surfaces forming four interior cornermost regions thereof complementary to and together forming inclined corners cooperating with said oblique bearing surfaces of said two parts with lateral pressure in four different directions substantially perpendicular to the oblique bearing surfaces and diagonally to the cross-section of the tubes when said screw clamping means is actuated to move said two parts apart, and

said two parts having aligned free ends formed with cooperating corresponding inclined planes constituting means for moving said two parts away from each other if said movable part begins to displace longitudinally in a direction of

removal of the tubes during commencement of uncoupling, said inclined planes are inclined in a direction toward said first part.

4,292,000

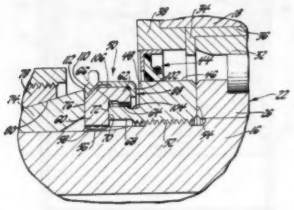
THRUST NUT LOCK RETAINER

Bryce R. Baldwin; Laurence M. Brady, and Warren N. Holcomb, all of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1979, Ser. No. 95,091

Int. Cl.³ B25G *3/00*; F16D *1/00*; F16G *11/00*

U.S. Cl. 403—320 **2 Claims**



1. A propeller shaft nut lock assembly for maintaining a propeller shaft bearing assembly in place within a bearing housing comprising: an externally threaded surface on a propeller shaft located outboard of the bearing assembly, a thrust nut threaded on said shaft to axially hold the bearing assembly in place within the bearing housing, said thrust nut including an undercut locking groove therein and an outboard extension with a splined surface, said shaft having a splined surface, a cup lock slidably positioned over said outboard extension and including an eccentric flange thereon initially radially positioned out of said lock groove and including a centering peripheral flange thereon initially located eccentrically with respect to the outer surface of said shaft, a thrust nut lock ring slidably mounted on said shaft engaging the centering peripheral flange to center it with respect to the shaft and to shift said eccentric flange into interlocked engagement with said groove, said thrust nut lock ring further having splined surfaces thereon engaging the two aforementioned splined surfaces, and coacting means to indicate axial seated engagement of said thrust nut lock ring against said thrust nut and radial shift of the eccentric flange into its interlocked engagement with the locking groove when said thrust nut is properly positioned with respect to the bearing assembly.

4,292,001

SHAFT COUPLING

Leonard S. Snell, Bristol, England, assignor to Rolls-Royce Limited, London, England

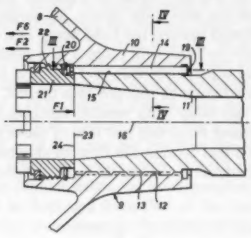
Filed Sep. 4, 1979, Ser. No. 72,099

Claims priority, application United Kingdom, Sep. 19, 1978, 37310/78

Int. Cl.³ F16B *7/18*; F16D *3/18*

U.S. Cl. 403—359 **10 Claims**

1. Shaft coupling comprising two relatively inner and outer members having a common axis, means defining first surfaces provided on the respective members in circumferentially confronting relationship, means defining second surfaces provided on the respective members in circumferentially confronting relationship, the first and second surfaces extending at different helix angles relative to said axis, urging means for urging the members relatively axially, said first and second surfaces cooperating, by virtue of the action of the urging means, to lock the members against relative axial movement and to impart to the



members opposing circumferential forces urging the members into engagement at said first and second surfaces respectively.

4,292,002

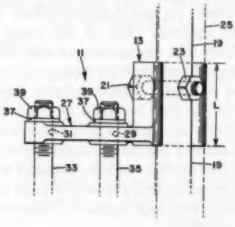
SHAFT LEVER COUPLING MEANS

Gary L. Stecklein, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 11, 1979, Ser. No. 102,381

Int. Cl.³ B25G *3/00*; F16D *1/00*; F16B *9/02*

U.S. Cl. 403—376 **2 Claims**



1. A shaft-lever attachment means, comprising a first section having a generally V-shaped cross-sectional configuration of length L to receive a portion of said shaft lengthwise within the interior walls of said first section; a securing means to apply a compressive load between the first section and said shaft; a second section extending generally perpendicular from said first section having at least one hole within said second section, said hole being generally parallel to the elongation of said first section, whereby at least one lever can be partially passed through said hole of said second section and secured therein such that rotation of said shaft will translate to rotation of said lever and axial displacement of said shaft can be translated to axial displacement of said lever.

4,292,003

CONNECTORS FOR FURNITURE

Alan R. Pond, London, England, assignor to Underman Greeman Berger Limited, London, England

Filed Apr. 26, 1979, Ser. No. 33,522

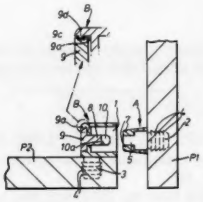
Claims priority, application United Kingdom, Apr. 28, 1978, 17062/78

Int. Cl.³ B25G *3/00*

U.S. Cl. 403—407 **2 Claims**

1. A connector for connecting two elements together in non-parallel relation, the connector comprising two elongated body members, means at one face of each body member to engage a respective one of said elements, a generally coaxially elongated cavity in another face of one of said body members non-parallel with said firstmentioned face thereof and dimensioned non-rotatably to receive the other body member

whereby said one face of the latter is exposed from the cavity, a stud having a head engageable with the bottom of the cavity to limit displacement of the stud into the cavity while permitting rotation of the stud about its axis, the stud having a T-shaped end portion within the cavity, the surfaces of the limbs of the T presented toward the head being cam surfaces oppositely angularly inclined with respect to a plane to which the axis of the stud is perpendicular, and a bore in said other body member perpendicular to said one face thereof, two shoulders integral with said other body member flanking the end portion of the bore remote from said one face of the other body member to give said end portion the form of an elongated slot, the ends of the shoulders inward of the bore comprising respective



abutment surfaces generally in a common plane to which the axis of the bore is perpendicular and cam surfaces oppositely inclined with respect to said common plane to extend from circumferentially opposite ends of the respective abutment surfaces away from said one surface of said other body member, the slot being dimensioned for passage therethrough of the limbs of the stud when the latter is suitably angularly oriented and the length of the stud between its head and limbs being such in relation to the dimensions of the shoulders that rotation of the stud will cause a camming action between the limbs of the stud and the cam surfaces of the shoulders which will draw said other body member into the cavity until the limbs of the stud ride onto said abutment surfaces releasably to hold said body members together.

4,292,004

PLATFORM LEG PLUG

Lloyd C. Knox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 828,065, Aug. 26, 1977, Pat. No. 4,215,951. This application Jun. 11, 1979, Ser. No. 47,198

Int. Cl.³ E02B *17/04*

U.S. Cl. 405—203 **14 Claims**

1. A removable plug for temporarily sealing the interior of an annular member to prevent the flow of fluid therethrough, said removable plug comprising:

plug body means disposed within said annular member, the plug body means including:

annular seal cup mandrel means having annular recess means about the interior thereof;

seal cup means located on the annular seal cup mandrel means for sealingly engaging the interior of said annular member to prevent the flow of said fluid therethrough;

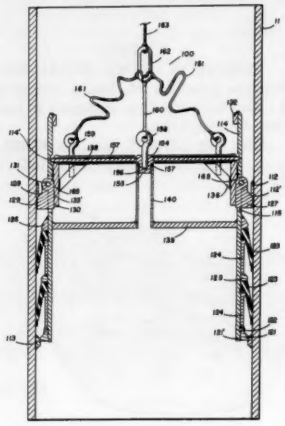
plug means having a centrally located sleeve therein, the plug means being secured to the interior of the annular seal cup mandrel means;

pressure equalization plug means releasably retained in the centrally located sleeve in the plug means in the plug body means for allowing the flow of said fluid through said removable plug before the removal of said removable plug from said annular member;

locking dog means pivotally mounted on the annular seal cup mandrel means for retaining said removable plug from axial movement in at least one direction in said annular member;

dog locking sleeve means slidably abutting the locking dog means; and

dog locking sleeve pin means having one end engaging the annular recess means about the interior of the annular seal



cup mandrel means and having the other end abutting the pressure equalization plug means releasably secured in the centrally located sleeve in the plug means in the annular seal cup mandrel means.

4,292,005

PIER CONSTRUCTION

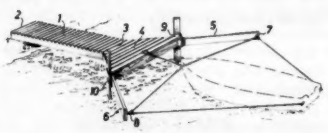
Lennart Boksjö, Utsiktsvägen 2 A, 436 00 Askim, Sweden

Filed Apr. 10, 1979, Ser. No. 28,916

Claims priority, application Sweden, Apr. 11, 1978, 7804019

Int. Cl.³ E02B *3/20*

U.S. Cl. 405—219 **3 Claims**



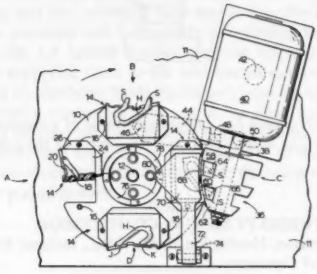
1. A pier for mooring of boats, formed of two sections, wherein: there is provided a rectangular inner section serving as a land-connection via a first short side and an outer section connected to said inner section at a second side oppositely disposed to said first short side of the inner section, said outer section being formed as a parallel trapezium which is supported by poles driven into a sea bed being affixed to said outer section; non-parallel sides of said outer section forming an angle of between 70°-120°; the non-parallel sides are formed with extensions, said extensions having respective ends provided with means for affixing a boat there at and partly for attachment of lines running from the ends to either end of the boat being affixed.

4,292,006

MANUFACTURE OF CERAMIC WARE

Graham Davies, Stoke-on-Trent, England, assignor to Service (Engineers) Limited, Stoke-on-Trent, England

Filed May 25, 1979, Ser. No. 42,638
Claims priority, application United Kingdom, May 25, 1978, 22276/78
Int. Cl.[3] B23C *3/00*
U.S. Cl. 409—131 9 Claims



1. A method of removing from a cup handle surplus clay in such a manner as to provide an attaching surface having a high degree of conformity to its intended shape comprising rotatably mounting a cutter blade on supporting portions of a carrier which are spaced apart to leave the blade unconfined along that part of its length which effects the cutting, contouring the unconfined part of said blade so that when rotated it defines by its arcuate path a shape to which it is desired the attaching surface of the handle to conform, mounting the handle in a holder from which the surplus clay projects,

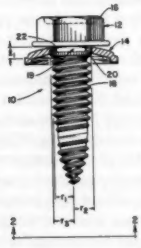
mounting the blade carrier so that its axis of rotation lies in a plane substantially parallel to the plane of said handle, rotating said carrier, causing relative lateral movement of approach between the handle and the rotational axis of the rotating cutter in such a manner as to remove the surplus clay progressively in small pieces in a plurality of separate cuts as said axis approaches the handle, and allowing said small pieces to escape between said carrier and the unconfined part of said blade.

4,292,007

FASTENER AND WASHER ASSEMBLY

David P. Wagner, Geneva, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 7, 1979, Ser. No. 92,150
Int. Cl.[3] F16B *39/26*
U.S. Cl. 411—156 4 Claims



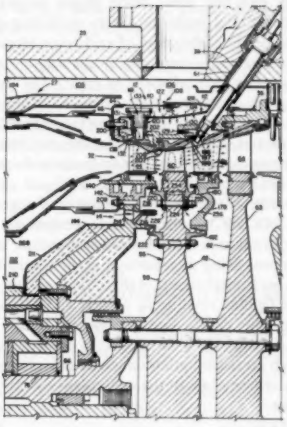
1. A preassembled fastener and washer assembly comprising a threaded fastener including an enlarged head, said fastener having a shank with a helical thread which has a predetermined maximum thread crest diameter, the upper extremity of the fastener threads being spaced a predetermined distance from the lower extremity of the head thereby defining an unthreaded portion, said unthreaded portion including an annular ledge; a domed washer having an inner and an outer periphery which define a predetermined axial length, said length being such that when the washer's inner periphery is in abutment with the lower extremity of the fastener head, the outer periphery of the washer extends beyond the unthreaded portion such that the domed washer encloses at least one convolution of a fully formed thread, said washer having a fastener receiving hole therein which has a diameter greater than the thread crest diameter but less than the diameter of the annular ledge whereby said washer is held captive on the fastener by said annular ledge, the inner periphery of said hole being reduced in thickness from that of the standard washer thickness in order to increase the flexibility of the inner periphery so that it may be sprung over the annular ledge to form the assembly.

4,292,008

GAS TURBINE COOLING SYSTEMS

William C. Grosjean, Poway, and John J. Hensley, Delmar, both of Calif., assignors to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 831,961, Sep. 9, 1977, Pat. No. 4,173,120. This application May 3, 1979, Ser. No. 35,632
Int. Cl.[3] F01D *5/18*
U.S. Cl. 415—115 3 Claims



1. A gas turbine comprising: a nozzle case through which heated gases are adapted to flow; a housing surrounding said case in spaced relation thereto; first and second stage, flow directing nozzles integrated into nozzle segments which are supported from said case, said case having a lip supporting the upstream ends of the second stage nozzle segments therefrom; means for directing a first stream of air from the space between said housing and said case into the nozzles in the first of said stages; means for directing a second stream of air from said space into impinging relationship with said case and then into nozzles in the second of said stages; and means for so discharging a part of said second stream of air from the interiors of the second stage nozzles into said nozzle case at the leading sides of said nozzles as to cause said air to first impingement cool said nozzle segment supporting lip and to then form a buffer for keeping heated gases flowing through said case from entering the space between said nozzles and said case.

4,292,009

HINGELESS ROTOR SYSTEM

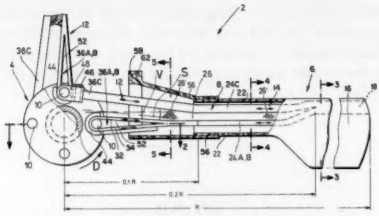
Emil Weiland, Hohenbrunn, and Klaus Brunsch, Weidach, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,740

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758086

Int. Cl.³ B64C *27/38*

U.S. Cl. 416—134 A **19 Claims**



1. A hingeless rotor system, especially for helicopters, comprising rotor mast means including an axis of rotation, rotor blade means having a radially inner end and a radially outer tip, and securing means connecting said radially inner end of said rotor blade means to said rotor mast means, said securing means comprising an integral carrier spar means of fiber compound material extending from said rotor mast means completely into said rotor blade means proper, said fiber compound material including fibers extending unidirectionally in the longitudinal direction of said rotor blade means, said integral carrier spar means including a substantially rigid connecting member (**12**) adjacent to said rotor mast means (**4**) for connection to said rotor mast means and an intermediate member (**14**) between said connecting member (**12**) and said radially inner end of said rotor blade means, said intermediate member (**14**) being resistant to tensile loads and comprising at least three spar sections (**24A, 24B, 24C**) and shear resistant web means (**26, 28**) operatively interconnecting said spar sections (**24A, 24B, 24C**) so that the spar sections are circumferentially spaced from each other by said web means, said shear resistant web means being dimensioned in the vertical direction (a) and in the horizontal direction (b) so that said intermediate member (**14**) is flexible relative to torsion and bending loads to form fictive hinge means, said web means (**26, 28**) forming a central member (**30**) having an outwardly open cross-section in which the web means are interconnected along a connecting line and the outer free edges of the web means are connected to the spar sections.

4,292,010

CAMBERED BLADE OR VANE FOR A GAS TURBINE ENGINE

Geoffrey W. Meetham, Allestree, and John R. Marjoram, Coxbench, both of England, assignors to Rolls-Royce Limited, London, England

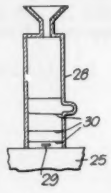
Filed Aug. 22, 1979, Ser. No. 68,723

Claims priority, application United Kingdom, Sep. 16, 1978, 37112/78

Int. Cl.³ F01D *5/14*

U.S. Cl. 416—241 R **11 Claims**

1. A blade or vane for a gas turbine engine, the blade or vane having a cambered aerofoil portion comprising a plurality of single crystals of an alloy, each crystal extending longitudinally of the aerofoil and having a predetermined three-dimensional orientation different from that of the other crystals such



that each such crystal has an optimum value of a chosen property in directions longitudinal and transverse of the aerofoil.

4,292,011

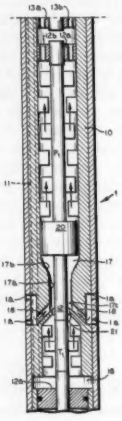
TURBO PUMP GAS COMPRESSOR

John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., City of Commerce, Calif.

Filed Aug. 20, 1979, Ser. No. 68,138

Int. Cl.³ F04B *23/04*

U.S. Cl. 417—53 **5 Claims**



1. An apparatus for pumping an oil well having wide variations of density in fluids to be pumped due to gas content, comprising, in combination: a source of pressurized power fluid; means for conducting said power fluid to the bottom portion of the well; a first turbo driven pump disposed in the bottom portion of the well and having the turbine thereof driven by said power fluid; a second turbo driven pump disposed axially adjacent said first pump and having its turbine driven by said power fluid; first conduit means for conducting well fluids to an inlet of said first pump; means disposed in said first conduit means for intermingling of the spent power fluid emerging from the turbine of said first pump with the well fluid in said first conduit, thereby producing an initial pressurizing of the fluid to the inlet of said first pump; means disposed in said first conduit between said intermingling means and the inlet of said first pump for increasing the pressurization of the intermingled fluids; second conduit means connecting an outlet of said first pump to an inlet of said second pump; and third conduit means for connecting an outlet of said second pump to the well head, whereby said first pump can be designed to efficiently pump low density fluid at relatively high shaft speeds and said second pump can be designed to efficiently

pump the discharge of said first pump at shaft speeds substantially lower than the shaft speed of said first pump.

4. A method for pumping an oil well having wide variations of density in fluids to be pumped due to gas content comprising the steps of: (a) disposing two turbo driven pumping units in the bottom portion of the well in axially stacked relationship; (b) driving the turbine portion of each of said turbo driven pumping units by pressurized fluid supplied from the well head; (c) supplying well fluids to the inlet end of one pumping unit; (d) intermingling the fluid leaving the turbine of said one pumping unit and said well fluid supplied to the inlet end of said one pumping unit for initially pressurizing the intermingled fluids; (e) further pressurizing the intermingled fluids prior to supplying them to the inlet end of said one pumping unit; and (f) supplying fluids discharged from the outlet of said one pumping unit to the inlet end of the other pumping unit, whereby said one pumping unit operates at substantially higher shaft speeds than the other pumping unit due to the substantial difference of density of fluid supplied to the respective inlets of the two pumping units.

4,292,012

LIQUID FUEL INJECTION PUMPING APPARATUS

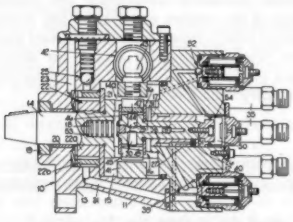
Collin P. Brotherston, Rainham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 12, 1979, Ser. No. 84,192

Claims priority, application United Kingdom, Nov. 25, 1978, 46082/78

Int. Cl.³ F04B *19/00, 29/00*

U.S. Cl. 417—462 **24 Claims**



1. A liquid fuel injection pumping apparatus for supplying fuel to internal combustion engines and of the kind comprising a body part, a rotary distributor member mounted in the body part and arranged in use to be driven in timed relationship with an engine with which the apparatus is associated, a transverse bore formed in the distributor member, a plunger in said bore, a cam follower positioned at the outer end of said plunger for engagement with a cam surface formed on a cam ring surrounding the distributor member, stop means for limiting the outward movement of the plunger, passage means for conveying fuel to and from said bore during rotation of the distributor member characterised in that said distributor member is axially movable within the body part, the apparatus including means for varying the axial setting of the distributor member within the body part, and said stop means comprises complementary inclined surfaces on the follower and a part respectively, said part being rotatable with the distributor member but axially fixed within the body part whereby as the distributor member is moved axially within the body part the amount by which the plunger can move outwardly whilst fuel is supplied to the bore will vary.

4,292,013

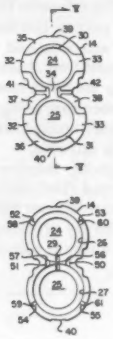
ROTARY IMPELLER OR MOTOR WITH PRESSURE BALANCED END PLATES

Carl M. Singer, New Castle, Pa., and Edward J. Ratkay, Canfield, Ohio, assignors to Commercial Shearing, Inc., Youngstown, Ohio

Filed Mar. 28, 1979, Ser. No. 24,612

Int. Cl.³ F03C *2/08;* **F04C** *2/18, 15/00*

U.S. Cl. 418—132 **12 Claims**



1. A pressure plate for corresponding ends of a pair of cooperating impellers in a rotary pump or motor comprising a metal body having an inlet and an outlet, said plate having a first face adapted to abut the impeller ends, a pair of openings to receive impeller shafts and a second face generally parallel to said first face, radial resilient sealing means on said second face spaced circumferentially around said openings to restrict flow across said rear face and forming chambers of similar size therebetween, one at the inlet side, one at the outlet side and at least one at each opposite end of said thrust plate intermediate the inlet and outlet sides and a plurality of chambers formed in said first face defined by radial lands corresponding generally to the sealing means on said second face and forming chambers corresponding to the chambers on the second face to restrict flow across said first face in generally the same areas as the seal means on the second face, whereby said plate is generally balanced in use in a pump.

4,292,014

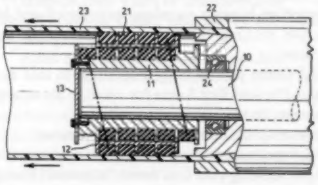
FEED MECHANISM COMPRISING AN ENDLESS MEMBER CONFIGURED AS A DOUBLE HELIX

Manfred A. A. Lupke, 35 Ironshield Crescent, and Gerd P. H. Lupke, 46 Stornoway Crescent, both of Thornhill, Ontario, Canada

Filed Sep. 12, 1980, Ser. No. 186,628

Int. Cl.³ B29F *3/00;* **F16J** *15/16*

U.S. Cl. 425—72 R **26 Claims**



9. In combination with an extrusion head for extruding a tube of plastic material, the extrusion head having an annular die opening defining a predetermined axis, means for supporting the tube of plastic material as it is extruded from the die comprising:

a rotary shaft extending from said extrusion head and journalled therein for rotation about said axis,

first and second cylindrical guide members mounted coaxially on said shaft for rotation therewith, the first and second guide members having respective external helical grooves thereon defining first and second feed channels,

said helical grooves being of the same pitch and opposite hand,

an endless flexible bearing member carried by said guide members and constrained thereby, the bearing member having a first portion extending helically along said first feed channel and a second portion extending helically along said second feed channel, the bearing member slidingly engaging the guide members along said channels,

the bearing member protruding from said second feed channel for frictional engagement with the tube of plastic material as it is extruded,

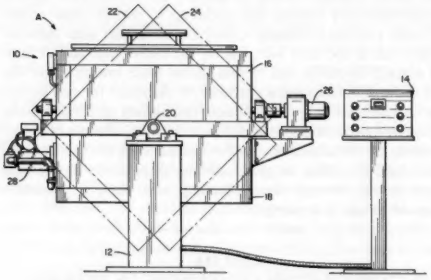
whereby the bearing member is continuously advanced along said second feed channel and returned along said first feed channel without rotation in response to rotation of the shaft, thereby providing a continuously advancing support surface for the plastic tube.

4,292,015

APPARATUS FOR ROTATIONAL MOLDING

Michael Hritz, 7463 Julia Dr., North Royalton, Ohio 44133

Filed Mar. 12, 1979, Ser. No. 19,836
Int. Cl.³ B29C *5/04*
U.S. Cl. 425—73 **14 Claims**



1. An apparatus for the rotational molding of materials, said apparatus comprising:

an outer housing constructed from heat insulating material, said housing including a first portion and a second portion in cooperation with each other to define a selectively disassociable arrangement;

a first frame substantially contained in said housing and mounted on bearing members exterior of said housing for selective rocking through a predetermined arc about a first axis;

a second frame substantially contained in said housing and mounted to said first frame for rotation about a second axis transverse to said first axis;

at least one mold mounted in said apparatus;

means for mounting said mold in said apparatus;

means for rocking said first frame in selective reciprocating arcuate cycles;

means for rotatably driving said second frame at predetermined speeds independently operable from said means for rocking said first frame; and

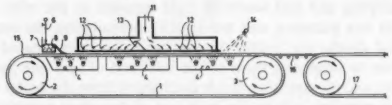
a source of heat communicating with the interior of said housing whereby material in said mold is rotationally molded to form a thin-walled product.

4,292,016

APPARATUS FOR SOLIDIFYING MOLTEN MATERIAL

Herbert J. Elliott, 63 Poulton Estate, Bradford-on-Avon, England

Division of Ser. No. 685,849, May 13, 1976, Pat. No. 4,088,727.
This application Mar. 13, 1978, Ser. No. 886,230
Claims priority, application Canada, Jun. 19, 1975, 229688
Int. Cl.³ B29C *23/00*
U.S. Cl. 425—101 **6 Claims**



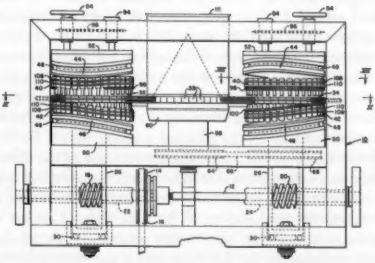
1. Apparatus for solidifying molten material comprising an endless belt having a molten material receiving solidification surface and mounted for travel along an endless path, and provided with a belt portion constituting a uniformly extending solid planar substrate arranged along a common uniformly extending portion of the endless path for travel without disturbance of the uniformly extending disposition of the solid planar substrate and without deviation from the uniformly extending portion of such path, said common portion of the endless path including an upstream molten material receiving station, and intermediate stream initial solidified protective stabilizing skin forming station and a downstream final solidification station, feed means spaced from said solidification surface at the receiving station for feeding molten material to such surface, treating agent distribution hood means spaced from said solidification surface and defining a covering zone over such surface which provides an isolated area for the molten material at the initial skin forming station for mildly and gently physically selectively supplying the surface of the molten material thereat with skin promoting treating agent and for correspondingly selectively distributing such treating agent onto the surface thereof, without substantial disturbance and rippling of the molten surface of the molten material by the treating agent, and fluid coolant nozzle means spaced from said solidification surface at the final solidification station for directing fluid coolant against the formed skin of the molten material thereat to cool and solidify such material.

4,292,017

APPARATUS FOR COMPRESSING TABLETS

Wallace A. Doepel, 226 Bellino Dr., Pacific Palisades, Calif. 90272

Filed Jul. 9, 1980, Ser. No. 167,267
Int. Cl.³ B30B *11/08, 15/00*
U.S. Cl. 425—107 **18 Claims**



1. Apparatus for compressing materials into tablets comprising a first turntable having means on its periphery for receiving tablet dies, a second turntable having means on its periphery for receiving tablet dies, means associated with said first turntable for filling dies spaced around its periphery with materials

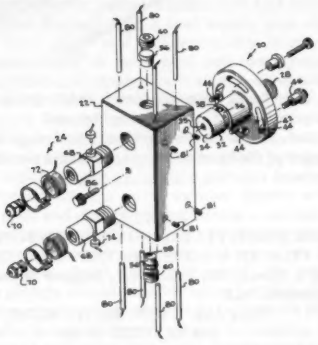
to be compressed, means for transferring dies which have been filled with product material from said first to said second turntable, and punches associated with said second turntable for compressing the material in the dies transferred from the first turntable to the second turntable.

4,292,018

DOUBLE NOZZLE BLOCK

Paul E. Beale, Columbus, Miss., assignor to Beatrice Foods Co., Chicago, Ill.

Filed May 21, 1980, Ser. No. 152,082
Int. Cl.³ B29F *1/03, 1/08*
U.S. Cl. 425—144 **9 Claims**



1. A double nozzle injector system for injecting hot molten plastic material comprising:

an elongated spindle coupling having inner and outer ends and including:

an external conical sealing surface extending outwardly from said inner end;

connector means on one end connectable to a pressurized source of molten plastic material; a main outflow passageway extending diametrically transversely through the spindle conduit at a location spaced outwardly of said inner end thereof;

an axial supply passageway extending between said outer end and said main outflow passageway;

an annular peripheral flushing groove extending inwardly about the surface of said spindle coupling and intercepting said main outflow passageway at opposite ends thereof; and a plurality of radial flush passageways extending between said flushing groove and said main outflow passageway with said radial flush passageways being substantially smaller than said main outflow passageway so that their flow capacity is a small percentage of the flow capacity of said main outflow passageway;

a manifold block having inner and outer face surfaces and including:

an internal conical sealing surface extending inwardly from said outer face surface and matingly engageable with said external conical sealing surface of said spindle coupling; first and second nozzle supply runners each having one end termination at said internal conical sealing surface and communicating with said flushing groove and said main outflow passageway;

first and second nozzles respectively communicating with said first and second runners for receiving molten plastic material therefrom;

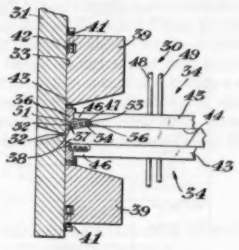
whereby molten plastic material flows through said axial supply passagewwy and outwardly through said main outflow passageway to said first and second runners and said first and second nozzles with a small percentage portion of the flow being outwardly through the radial flush passageways to the annular peripheral flushing groove and then into said first and second runners.

4,292,019

EXTRUDED PLASTIC FOAM SHAPING APPARATUS

Robert A. Hay, MIdland, and Oswald Bergman, Freeland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 7, 1980, Ser. No. 110,049
Int. Cl.³ B29D *27/00*
U.S. Cl. 425—325 **5 Claims**



1. A shaping apparatus adapted to be disposed adjacent a slot extrusion die for shaping freshly extruded synthetic resinous thermoplastic foam into a generally planar configuration, the apparatus comprising a pair of generally like opposed shaping elements of generally planar configuration, the apparatus having an inlet end and a discharge end, each of the shaping elements comprising a first forming plate adapted to be disposed adjacent the die face, the first forming plate having an edge extending generally parallel to a plane containing the axis of extrusion and the major axis of a die slot the first forming plate having an edge remotely disposed from the discharge end and generally facing the discharge end, a second forming plate having a first edge and a second edge, the second forming plate being generally parallel to the first forming plate and to edge to edge engagement therewith, a third forming plate having first and second edges and being in generally edge to edge engagement with the second forming plate and generally parallel thereto, the plates in edge to edge engagement having a convex semi-cylindrical edge in engagement with a mating concave semi-cylindrical edge, whereby when third plates or first plates of opposed shaping elements are moved closer together or moved away from each other, the second plate effectively maintains engagement with the edges of the first and third plates and moves to adjustably position the first and third plates towards or away from each other.

4,292,020

METHOD AND APPARATUS FOR ABATEMENT OF GASOLINE VAPOR EMISSIONS

John H. Hirt, Fullerton, Calif., assignor to Hirt Combustion Engineers, Montebello, Calif.

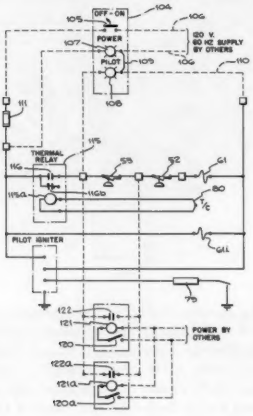
Filed May 31, 1979, Ser. No. 44,037
Int. Cl.³ F23D *13/20*
U.S. Cl. 431—5 **4 Claims**

1. In a method of installing a gasoline vapor control system for a gasoline service station having gasoline storage tanks in fluid communication with gasoline dispensing pumps having dispensing nozzles cooperable with a fill pipe on a vehicle tank, said fluid communication including a flow path for liquid gasoline and a flow path to return gasoline vapors from the fill pipe to the storage tanks, a vent means in communication with said storage tanks whereby gasoline vapors are collected in said vapor flow path, said storage tanks, and said vent means, and a vapor disposal means remote from said pumps and storage tanks and connected with said vent means, said disposal means including a burner means, a pilot means, and ignition

means for said pilot means, a means for moving vapors to each of said burner means and pilot means, a pressure air source in communication with said moving means and valve means associated therewith, said pilot means and disposal burner means being operable only in the presence of a supply of pressure air to move said vapors in said system to the burners, and pressure sensing switch means in communication with said vent means, the steps of:

providing a single vapor burning means;

providing two pressure sensing switch means to comprise said pressure sensing means;



setting a first one of the two pressure sensing switch means at a pressure dependent upon pressure at any location in said vapor control system to just below atmospheric pressure regardless of pressure variations in said system,

and actuating the disposal means to maintain said below atmospheric pressure as said pressure in said system approaches atmospheric pressure;

said first one of said pressure sensing switch means having a dead band whereby the selection of said just below atmospheric pressure and the pressure sensing switch means dead band provides both high and low response of the switch means for maintaining the selected just below pressure in the system.

4,292,021

GAS LIGHTER

Yoshihisa Miyagawa, Sagamiharashi, Japan, assignor to Iwatani Sangyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 6, 1980, Ser. No. 119,097

Claims priority, application Japan, Nov. 2, 1979, 54-153030[U]

Int. Cl.³ F21K *5/00*

U.S. Cl. 431—13 **3 Claims**

1. A gas lighter adapted for use in a kitchen, said gas lighter comprising:

a handle portion;

a nozzle portion having an ignition point at its terminating end;

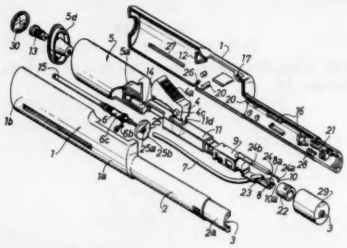
said handle portion including a fuel container, a trigger workable by a finger touch and a fuel control knob;

said nozzle portion being prolonged sufficiently to keep the operator's hand at a safe distance from the gas flames;

said nozzle portion including a piezoelectric switch electrically connected to said ignition point, and located at an effectively shortened distance therefrom;

a fuel supplying pipe connecting said fuel container to said ignition point with a valve interlocated therebetween;

said trigger being rotatably carried on said handle portion, and being in engagement with a spring-loaded lever slidable along the length of said nozzle portion, wherein said lever is connected to said valve at one end to secure their associated movement while being in engagement with said switch at the other end;



said lever being normally biased under spring load to the inoperative state of the gas lighter, and

said fuel control knob being located in a range reached by a finger of the hand to grasp said handle portion with.

4,292,022

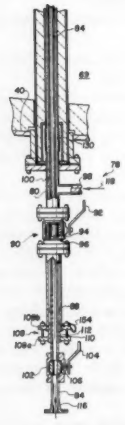
PRESSURIZED FLUIDIZED BED COMBUSTOR AND COAL GUN CONSTRUCTION THEREFOR

William S. Hosek, Mt. Tabor, N.J., assignor to Curtiss Wright Corporation, N.J.

Filed Aug. 1, 1979, Ser. No. 62,745

Int. Cl.³ F23D *19/00*

U.S. Cl. 431—170 **8 Claims**



1. A fluidized bed combustor comprising a housing defining an interior chamber having a top portion for the discharge of combustion gases and having a bottom with an outlet for cooling fluid, a distributor plate extending across a lower portion of said chamber having a plurality of tuyeres for the discharge of fluidizing air therethrough, means defining a windbox below said plate communicating with said tuyeres, means defining a heat exchanger inlet plenum below said windbox having a plurality of tubes extending therethrough for the passage of air to said windbox, means defining a lower section below said heat exchanger inlet plenum with a connection to an air supply for supplying air through the tubes to said windbox, heat exchanger tube means adapted to extend above said distributor plate and being mounted in said windbox and said heat exchanger inlet plenum and said lower section and having a

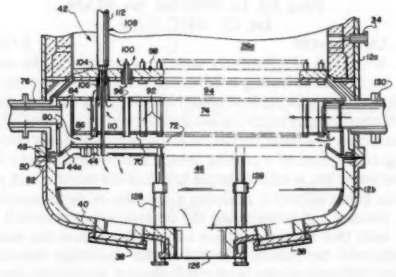
passage from said heat exchanger inlet plenum upwardly through said heat exchanger tubes above the distributor plate and then downwardly back to the distributor plate for discharge below said lower section to the outlet for the cooling fluid, means for circulating a cooling fluid into said heat exchanger inlet plenum around said tubes extending therethrough and into said heat exchanger tubes for flow upwardly therethrough and then downwardly for discharge after they are heated to outlet for the cooling fluid, means defining a fluidized bed area above the distributor plate in the vicinity of the upper portions of said heat exchanger tubes, and a coal supply gun including an outer guide pipe extending substantially vertically through the bottom of said housing through said lower section, said heat exchanger inlet plenum and said distributor plate terminating in said chamber above said distributor plate, said chamber having a space over said distributor plate defining a fluidized bed, a coal supply pipe disposed within said outer guide pipe and terminating in a top end extending substantially to the top of said outer guide pipe having an opposite coal supply pipe bottom end extending out of the bottom end of said outer guide pipe, means for directing air into the space between said coal supply pipe and said outer guide pipe for discharge in the fluidized bed, an outer guide pipe shut-off valve provided in said outer guide pipe at a location thereof which extends out of the combustor housing, said shut-off valve including a valve member therein which is movable to open and close the valve having a passage therethrough which aligns with the interior of said outer guide pipe when the valve is open and which extends transversely thereto when the valve is closed, said coal supply pipe extending through the passage of said movable valve member when the passage is aligned with the interior of said outer guide pipe, and a shut-off valve in said coal supply pipe in the position thereof extending out of said outer guide pipe and exteriorly of said housing chamber and being closeable to close off said coal supply pipe, said coal supply pipe being withdrawable from said outer guide pipe to a location below said outer guide pipe shut-off valve, said outer guide pipe shut-off valve being closeable to close off said outer guide pipe and permit further withdrawal of said coal supply pipe from the bottom of said combustor.

4,292,023

FLUIDIZED BED COMBUSTOR AND REMOVABLE WINDBOX AND TUBE ASSEMBLY THEREFOR

Angelo DeFeo, Totowa, and William S. Hosek, Mt. Tabor, both of N.J., assignors to Curtiss-Wright Corporation, N.J.

Filed Aug. 1, 1979, Ser. No. 62,746
Int. Cl.³ F23D *19/00*
U.S. Cl. 431—170 **18 Claims**



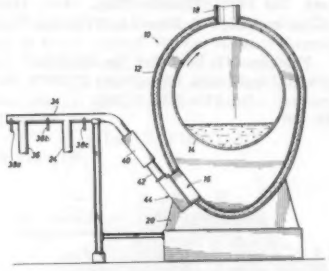
13. A fluidized bed combustor, comprising a housing having a chamber therein and a top with a discharge for gases and a bottom with a discharge for heated fluid, an assembly in the lower portion of said chamber including a heat exchange inlet plenum and a windbox and a distributor plate wall, a portion of said chamber above said distributor plate wall defining a fluidized bed, support means supporting said assembly in said chamber at a spaced location above the bottom thereof, the space in said chamber between said bottom and said assembly defining a fluid discharge plenum opening to said discharge, means for directing fluidized air into said assembly and through said heat exchanger plenum and into said windbox, nozzle means in said distributor plate for discharging fluidized air from said windbox into said fluidizing bed, means for directing coal into said fluidizing bed for ignition with said fluidizing air, and heat exchanger tube means mounted on said assembly and extending into said fluidizing bed having a cooling fluid inlet for the inflow of bed cooling air to said tube assembly, said support means including an annular first support flange extending around the periphery of said chamber, said assembly including a lower plate having a second support flange portion engaged on said first support flange, insulation means disposed between said first support flange elements and said second support flange portion, said insulation means comprising a plurality of stacked rings of insulation and a plurality of rings of wire screening interposed between at least some of said stacked rings of insulation and thread means sewn to said rings to hold them together.

4,292,024

METHOD OF AND APPARATUS FOR BURNING WET LEAN GAS

David F. Pobst, Houston, Tex., assignor to Sid Richardson Carbon & Gasoline Company, Forth Worth, Tex.

Filed Dec. 18, 1979, Ser. No. 104,961
Int. Cl.³ F27B *15/00, 7/08*
U.S. Cl. 432—13 **10 Claims**



1. The method of burning a very lean gas including the steps of

mixing the lean gas with an oxidant gas,

flowing all of the mixed gases through a plurality of slots defined between a plurality of parallel positioned elongate members to establish a plurality of plane parallel jets issuing from the slots, and

igniting the mixed gases flowing from said slots.

4,292,025

ORTHODONTIC DEVICE FOR ROTATING A TOOTH

Rolf Förster, Pforzheim, Fed. Rep. of Germany, assignor to Bernhard Förster GmbH, Pforzheim, Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 157,388
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1979, 791639[U]
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—18 **9 Claims**

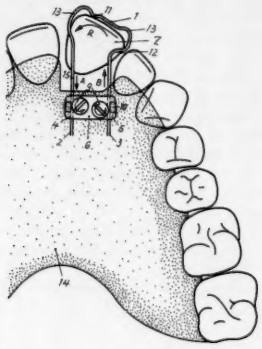
1. An orthodontic device for rotating a tooth comprising:

a base plate having an aperture, a body secured to said base plate and received in the aperture thereof, said body having two juxteposed, spaced apart through holes,

cylindrical roller means rotatably mounted in said body, and positioned perpendicularly to and between said holes, and an integrally formed wire loop which is adapted to be dis-

posed around a tooth to be rotated, and which has two wire end portions extending through said body, respectively traversing and being guided in said holes,

said roller means having outer edge portions biting into the sides of said wire end portions in said holes,



said holes being laterally open toward said roller means to expose said wire end portions to said outer edge portions,

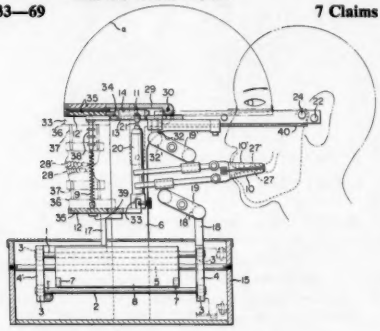
said roller means being rotatable to move said wire end portions in said holes by means of said outer edge portions so as to effect rotation of the tooth.

4,292,026

ARTICULATOR

Seizo Yokota, 2nd Floor, Konoike Bldg., 14-45, Daimyo 1-chome, Chuo-ku, City of Fukuoka, Fukuoka Prefecture, Japan

Filed Jan. 17, 1980, Ser. No. 113,130
Claims priority, application Japan, Mar. 27, 1979, 54-37489
Int. Cl.³ A61C *19/04*
U.S. Cl. 433—69 **7 Claims**



1. An articulator for reproducing the occlusion of a mandible and a maxillary of a patient, said articulator comprising:

a fixed frame;

a material holding means on said frame for holding a solid machinable material;

a maxillary cast holding means removably mounted in a fixed position on said frame;

a first bite fork adjustably mounted on said frame for holding and positioning the maxillary relative to said fixed frame;

a second bite fork for holding the mandible, said second bite fork being opposed to said first bite fork;

a link means on which said second bite fork is adjustably mounted for transmitting the movement of said mandible;

a mandibular cast holding means on said link means and opposed to said maxillary cast holding means for holding a mandibular cast opposed to a maxillary cast on said maxillary cast holding means;

machining means mounted on said link means for movement with said mandibular cast holding means; and

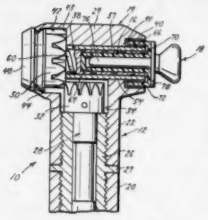
a fixed beam attached to said frame on which a part of said link means is pivotally mounted and supporting part of the weight of said link means and spring means connected between said frame and said link means for supporting the remainder of the weight of said link means.

4,292,027

SEALING DENTAL COLLET

George E. Richmond, Ladue, Mo., assignor to Young Dental Manufacturing Co., Hazelwood, Mo.

Filed Jul. 23, 1979, Ser. No. 59,525
Int. Cl.³ A61C *1/14*
U.S. Cl. 433—127 **11 Claims**



1. A dental handpiece assembly for rotating a dental tool comprising:

(a) a head for receiving the tool, the head having a recess at the end of the head from which the tool extends, said recess has a side surface; and

(b) a tool engaging member rotatable received within the head for engaging the tool for rotational drive relative to the head; and

(c) a flexible skirt extending outwardly from connection with the tool engaging member and having its end within said head recess so that rotation of the skirt moves the skirt outwardly by centrifugal force to engage the surface of the recess to form a seal between the recess and the skirt.

4,292,028

COSMETIC BREATH FRESHENER AND PALATE COOLANT COMPOSITION AND METHOD OF USE

Arthur Barr, 2942 Shore Dr., Merrick, N.Y. 11566

Filed Jul. 13, 1979, Ser. No. 57,449
Int. Cl.³ A61C *13/22*
U.S. Cl. 433—180 **2 Claims**

1. A method of adhesively securing a denture in the mouth of a user while releasing a flavoring material and providing a cooling effect, said method comprising forming a paste composition consisting of microencapsulated droplets of liquid flavoring material in a paste carrier, said microencapsulated droplets being constituted of a coating which is substantially non-soluble in water but is soluble in the saliva of the mouth, said paste carrier being adhesive, applying a quantity of the composition to a denture and introducing the denture into the mouth of a user such that the composition adhesively secures the denture in place in the mouth whereafter the flavoring material is slowly released in situ in the mouth at a sustained rate, the composition of the liquid flavoring material and its encapsulation in the carrier being such as to provide a cooling effect in the mouth of the user as the droplets of material are slowly dissolved and thereby opposing warming effect normally produced by the denture in the mouth, said microencapsulated droplets being present in an amount of 6% by weight and consisting of the following in percent by weight;

Liquid flavoring material	91%
Gelatin	4.25%
Gum arabic	4.25%
Glutaraldehyde	.25%
Sodium silicate	.25%

said paste carrier consisting of the following in percent by weight;

Karaya gum	51%
Petrolatum	30%
Propylparaben	0.1%
Mineral oil	12.4%
Titanium dioxide	0.4%

4,292,029

HYDROPHOBIC COMPOSITE RESTORATIVE MATERIALS AND THEIR USE IN TOOTH TREATMENT

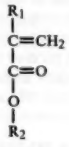
Robert G. Craig, Ann Arbor, Mich., and William H. Douglas, Cardiff, England, assignors to University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 905,936, May 15, 1978, abandoned. This application Sep. 5, 1979, Ser. No. 72,676

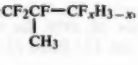
Int. Cl.³ A61K *5/06*

U.S. Cl. 433—228 **10 Claims**

1. In a process for treating a tooth, the steps comprising applying a polymerizable dental composition to a surface of the tooth, said composition comprising a mixture of from about 10 to about 90% by weight of a finely divided, inert organic filler and from about 90 to about 10% by weight of at least one polymerizable fluorine-containing prepolymer selected from the group consisting of perfluoroalkyl acrylates, aromatic diacrylates containing ring substituted fluorine, fluorinated acrylates of the formula



where R_1 is a C_1–C_4 alkyl group, R_2 is a fluorinated group selected from $-(CF_2)_n-CH_3$, $-(CF_2)_3$, $-\phi F_{1-6}$, and



where ϕ is phenyl, n is an integer from 1 to about 8 and x is an integer from 1 to 3, and fluorinated analogues of aliphatic diacrylates and mixtures thereof; and polymerizing said composition on the tooth surface, said composition, when polymerized, (1) being hydrophobic such that the sum of the free surface energy changes as a result of saliva wetting the tooth surface and said polymerized composition is positive and (2) exhibiting an advancing contact angle in relation to water of at least 130°.

4,292,030

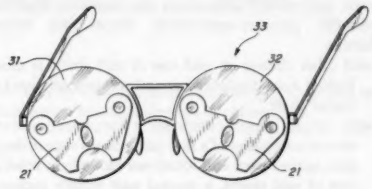
TEACHING DEVICE FOR PROGRESSIVE POWER LENSES

Alban J. Lobdell, Plantation, and Wiktor J. Rupo, Hollywood, both of Fla., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 16, 1980, Ser. No. 112,588

Int. Cl.³ G09B *19/00*

U.S. Cl. 434—262 **11 Claims**



1. A teaching device for use with progressively variable focal power lenses, said lenses being characterized by having at least a reading portion (**13**), a distance portion (**12**) and a progressive power portion (**14**), said teaching device comprising teaching means (**21**) adapted to be applied to one of the surfaces of said lens, and including identifying means (**22**, **23** or **24**) for identifying the location of at least a part of one of said portions for assisting a user of such a lens in adapting to its use.

4,292,031

INFINITELY VARIABLE CONE-PULLEY TRANSMISSION

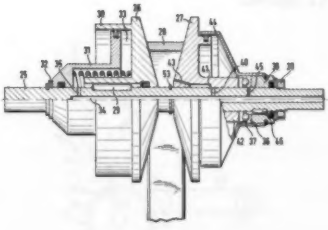
Manfred Rattunde, Bad Homburg, Fed. Rep. of Germany, assignor to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft, Bad Homburg, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,605

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846580

Int. Cl.³ F16H *11/02*

U.S. Cl. 474—18 **11 Claims**



1. In an infinitely variable cone pulley transmission which includes a drive input shaft, a drive output shaft, a first pair of cone pulley sheaves arranged on the input shaft, a second pair of cone pulley sheaves arranged on the output shaft, transmission means circulating between the two pairs of pulley sheaves, with one pulley sheaves of each pair being mounted to be axially displaceable relative to, and rotatable with, its associated shaft, first and second pistons each fastened to a respective one of the input and output shafts, means including the one sheave of each pair defining two pressure cylinders each axially movable on its respective shaft, enclosing a respective piston, and defining with its respective piston a transmission ratio control chamber, a source of hydraulic pressure medium, a control slide valve presenting four control edges connected between the source and the control chambers for distributing pressure medium to the control chambers, a setting lever connected between the slide valve and the one sheave of one of the

pairs, a torque sensor mounted on one of the shafts to sense the torque on that shaft for generating a pressure application force dependent on the load on the transmission, the torque sensor being connected to receive pressure medium at the pressure prevailing in one of the control chambers, and including a flow control valve for permitting pressure medium to flow from the sensor, the flow control valve being composed of two valve parts which are movable relative to one another to generate, in the sensor, a torque-dependent hydraulic pressure such that the sensor exclusively determines the requisite load-dependent, hydraulic pressure-application force, the improvement wherein:

said other sheave on said one of said shafts is mounted for limited axial displacement and rotation relative to its associated shaft;

said torque sensor comprises a torque-responsive presser device composed of a first part, means supporting said first part against axial and rotational movement relative to said one of said shafts, a second part rigidly secured to said other sheave on said one of said shafts, and rolling bodies interposed between said parts, said parts presenting mutually opposing, axially oblique faces against which said rolling bodies bear for axially displacing said other sheave and said second part relative to said one of said shafts and said first part by a distance dependent on the torque between said parts; and

said other sheave is operatively associated with said flow control valve for causing movement of said other sheave relative to its associated shaft to control the relative movement between said valve parts.

4,292,032

PRODUCTION OF TOBACCO-SMOKE FILTERS

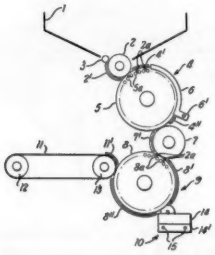
John A. Luke, Romsey, England, assignor to British-American Tobacco Company Limited, London, England

Filed Oct. 4, 1979, Ser. No. 81,864

Claims priority, application United Kingdom, Oct. 19, 1978, 41133/78

Int. Cl.³ A24C *5/50*

U.S. Cl. 493—43 **20 Claims**



1. A method for producing rod-shaped tobacco-smoke filter components each having at least one annular tobacco-smoke barrier, wherein rod-shaped bodies of smoke-filtration material formed with at least one annular groove open at the periphery are rotated about their longitudinal axes while being conveyed in a direction transverse to their said axes along an arcuate path past at least one deposition member for a settable liquid barrier material supplied to that member, the said member being located to extend into the grooves during the conveyance of the bodies along the path, the material being transferred from surface to surface of the member and grooves during the relative movement between them and the barriers being produced by the material when set.

4,292,033

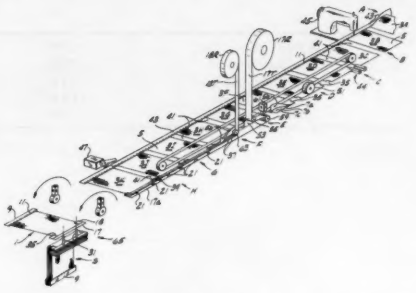
METHOD OF PROVIDING NET BAGS WITH WICKETING FLAPS

Eugene H. Wolske, Minnetonka, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.

Division of Ser. No. 860,290, Dec. 14, 1977, Pat. No. 4,207,983. This application Jan. 21, 1980, Ser. No. 113,825

Int. Cl.³ B31B *1/90, 1/98*

U.S. C.. 493—221 **13 Claims**



1. The method of providing net bags with flap means, each bag having opposed walls and being open at one end constituting its mouth end, each wall thereby having a mouth edge, the flap means being provided at the mouth end of the bag, comprising:

feeding forward a series of said bags one after another in a predetermined path with the bags extending transversely of said path and spaced longitudinally along said path with spaces between successive bags and with the mouth ends of the bags generally aligned;

securing a tape to one wall of the bags as they are fed forward with the tape extending longitudinally of said path and transversely of the bags at the mouth ends of the bags, the tape extending from bag-to-bag across the spaces between successive bags and overlapping the mouth end of said one wall of the bags, the tape projecting beyond the mouth edge of said one wall of the bags to a free edge spaced outwardly of the mouth edge of the bags; and

severing the tape between the leading bag of the series and the next bag thereby to separate the leading bag from the next bag, with the leading bag having the separated portion of the tape secured to said one wall thereof as a flap projecting beyond the mouth edge of said one wall of the bag, the portion of the flap projecting beyond the mouth edge being adapted to receive means for holding a plurality of the bags in stacked assembly, the flap of each bag being adapted to be torn off said holding means.

4,292,034

PARTITION FOLDING AND INSERTING MACHINE

Keith A. Probyn; Richard W. Nolen; Charles W. Erickson; Gerald G. Dawson, all of Mapleton; Ralph Goldstein, and Max Bender, both of Carol Stream, all of Ill., assignors to Northern Petrochemical Co., Omaha, Nebr.

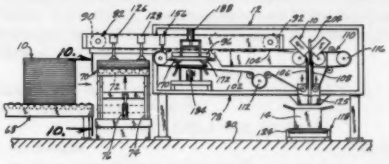
Filed Nov. 28, 1979, Ser. No. 98,236

Int. Cl.³ B31B *11/26*

U.S. Cl. 493—92 **10 Claims**

8. An apparatus for folding and inserting a partition into a box, the partition comprising a single sheet folded upon itself to form top and bottom blank portions having rearward and forward ends and opposite side edges, a partition blank support means for supporting a plurality of flat partition blanks stacked thereon, means for vertically moving said blank support means whereby the position of the uppermost blank may be selectively positioned, a partition folding and inserting machine including a feed end and a discharge end, said blank support

means being positioned adjacent the feed end of said machine, a vacuum pick-up means at the feed end of said machine positioned above said blank support means for picking up the uppermost blank from the stacked blanks, a conveyor means on said machine for feeding the blank into said machine, a tab breaking means on said machine for breaking said blank inwardly from its side edges towards the center portion thereof, intermediate the forward and rearward ends thereof, a cell opening means on said machine for engagement with the blank at the opposite sides thereof for folding the side edges thereof downwardly with respect to the center portion thereof to create elongated first and second cells, a side plow means on said machine for forming said first and second cells into a rectangular configuration as said conveyor means moves the blank through, a partition tucker assembly for folding said blank upon itself whereby each of said first and second cells are separated to form a pair of cells, the cells at one side of said folded blank being spaced from the cells at the other side of



said folded blank by a pair of cells, and means for inserting said folded blank into a box to define six container cells.

4,292,035

FABRIC SOFTENING COMPOSITIONS

Charles F. Battrell, Ft. Mitchell, Ky., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 960,147, Nov. 13, 1978, abandoned. This application Nov. 20, 1978, Ser. No. 962,452

Int. Cl.[3] B08B *3/00;* C11D *1/18*

U.S. Cl. 8—137 23 Claims

1. A fabric softening composition in solid form comprising:

(a) from about 10% to about 80% by weight of an impalpable smectite clay having an ion exchange capacity of at least 50 meq/100 grams;

(b) from about 1% to about 50% by weight of said clay of a compound selected from the group consisting of organic primary, secondary, and tertiary amines and their water soluble or water dispersible salts and organic quaternary ammonium, phosphonium and sulfonium compounds wherein said compounds have at least one hydrocarbon group having from 8 to 22 carbon atoms; and

(c) an anionic surfactant present in the amount of at least 30% molar equivalence to component (b);

wherein components (a) and (b) are combined to form a complex prior to the addition of the anionic surfactant.

4,292,036

PROCESS FOR IMPARTING FLAME RETARDANCE TO TEXTILE MATERIALS

Edward N. Walsh, New City, N.Y., and Thomas A. Hardy, Fairfield, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 5, 1980, Ser. No. 146,582

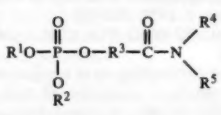
Int. Cl.[3] C07F *9/11, 9/40;* D06M *1/00, 13/34*

U.S. Cl. 8—182 7 Claims

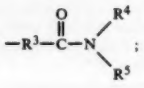
1. A process for imparting flame retardance to a textile material comprising the steps of

(a) impregnating said textile material with a flame-retardant composition comprising

(1) at least one compound represented by the formula



wherein R^1 and R^2 are each independently selected from the group consisting of aryl, arylalkyl, alkylaryl, alkenyl and alkyl having from 1 to about 6 carbon atoms and



R^3 represents an alkylene group having from 1 to about 5 carbon atoms, and R^4 and R^5 are each independently selected from the group consisting of hydrogen,

$-CH_3$, $-CH_2OH$, $-C_2H_4OH$ and

wherein R^6 represents an alkyl group having from 1 to about 5 carbon atoms, provided that not all of said R^4's and R^5's are $-CH_3$ at the same time;

(b) an aminoplast; and

(c) an acid catalyst; and

(2) heating said impregnated textile material sufficiently to cure said flame-retardant composition.

4,292,037

PROCESS FOR DYEING CELLULOSE-CONTAINING FIBRE MATERIALS

Pierre Galafassi, Rixheim; Jean-Marie Adam, St. Louis, both of France; Peter Loew, Münchenstein, and Hans Scheidegger, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 29, 1980, Ser. No. 116,379

Claims priority, application Switzerland, Feb. 2, 1979, 1043/79; Jun. 6, 1979, 5268/79

Int. Cl.[3] C09B *67/00, 44/00*

U.S. Cl. 8—554 44 Claims

1. A process for dyeing cellulosic fibers comprising the step of applying an aqueous dye liquor to the fibers in the presence of a cationic levelling agent and in the substantial absence of other electrolytes, wherein the aqueous dye liquor contains a cationic dye which is a planar molecule having at least one system of delocalized π-electrons of at least 9 conjugated doubled bonds.

4,292,038

FORMAMIDE-CONTAINING LATEX AGGLUTINATING REAGENT FOR IMMUNOASSAY

Koichi Kondo, Osaka; Isamu Yoshida, Takatsuki, and Takashi Kobayashi, Hikari, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

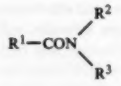
Filed Jan. 29, 1980, Ser. No. 116,465

Claims priority, application Japan, Jan. 31, 1979, 54-10552; May 31, 1979, 54-08504

Int. Cl.[3] G01N *33/54*

U.S. Cl. 23—230 B 8 Claims

1. In an immunoassay comprising incubating a test sample with particles sensitized with an antigen or antibody and observing any resulting agglutination, the improvement wherein the reaction is conducted in the presence of one or more members selected from the group consisting of a compound of the formula



wherein R^1 is a hydrogen atom, a lower alkyl group or an amino group which may be substituted with a lower alkyl group and R^2 and R^3 are each a hydrogen atom or a lower alkyl group, and a di-lower alkyl sulfoxide.

4,292,039

METHOD AND APPARATUS FOR CONTROLLING DISSOLVED SOLID CONCENTRATIONS

Clyde A. Farris, 1736 Choto Rd., and Clyde A. Farris, Jr., 11130 Crown Point Dr., both of, Knoxville, Tenn. 37922

Filed Mar. 24, 1980, Ser. No. 133,514

Int. Cl.[3] G01N *27/00, 27/26*

U.S. Cl. 23—230 A 7 Claims

5. A method for maintaining generally constant concentrations of solutions contained in a plurality of sequentially communicating liquid baths for treating a fabric web by successive immersion in said liquid baths, including a first bath containing a first solution having a first concentration of dissolved solids and a second bath containing a second solution having a second concentration of dissolved solids, comprising

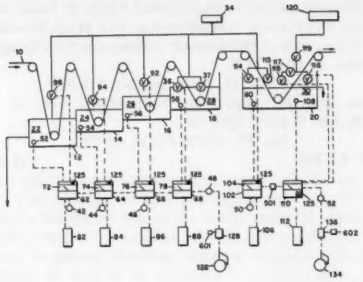
monitoring the conductivity of said first solution,

adding make-up liquid to said first solution when the conductivity of said first solution exceeds a predetermined control point for said first solution,

flowing said first solution into said second bath,

monitoring the conductivity of said second solution, adding make-up liquid to said second solution when the conductivity of said second solution exceeds a predetermined control point for said second solution, and

preventing the addition of make-up liquid to said second solution unless the conductivity of said first solution ex-



ceeds the predetermined control point for said first solution.

4,292,040

ISOLATION AND DETERMINATION OF NITROSOAMINES

Robert J. Daniels, Florissant, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 27, 1980, Ser. No. 163,746
Int. Cl.³ G01N *31/22, 31/08*
U.S. Cl. 23—230 R **4 Claims**

1. A method for quantitatively determining the nitrosoamine content of a sample containing a nitrosoamine which comprises sequentially the steps of:

(a) separating said nitrosoamine from said sample by employing chromatographic means;

(b) admixing said separated nitrosoamine with a composition comprising hydrogen bromide, sulfanilamide, hydrochloric acid, Brij 35 surfactant, said Brij 35 surfactant comprising polyoxyethylene (23) lauryl ether, and N-(1-naphthyl-)ethylenediamine hydrochloride whereby a stable colored complex is formed which is readily detectable employing spectrophotometric means.

4,292,041

SURFACTANT ASSAY

W. Wardle Fullerton, King of Prussia, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 2, 1979, Ser. No. 90,768
Int. Cl.³ G01N *31/08*
U.S. Cl. 23—230.3 **10 Claims**

1. A chromatographic method for the separation, detection and quantitation of an anionic, nonionic or cationic surfactant alone or in a surfactant-containing protein, glycoprotein, lipoprotein, polysaccharide, or lipopolysaccharide at levels below about 5 μg 1 mg comprising

extracting the surfactant or surfactant-containing protein, glycoprotein, lipoprotein, polysaccharide, or lipopolysaccharide with a solvent mixture comprising a haloalkane, a water-miscible alkanol and water,

subjecting the extract containing the surfactant to thin layer chromatography wherein the support medium is a silica or alumina gel and the developing solvent is a mixture comprising a haloalkane, a water-miscible alkanol and water,

removing the developing solvent, and

detecting the surfactant sequentially with (a) iodine vapor, (b) rhodamine 6G and (c) phosphomolybdic acid, or with radiolabeled surfactant.

4,292,042

ANALYSIS OF VINYL ACETATE

Howard J. Kimble, Scott Depot, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 14, 1980, Ser. No. 149,732
Int. Cl.³ G01N *1/22, 31/08*
U.S. Cl. 23—232 R **7 Claims**

1. A method of measuring the amount of vinyl acetate monomer in an ambient air atmosphere which comprises the series of steps of:

(A) contacting a measured volume of ambient air containing vinyl acetate monomer vapor with drying means thereby freeing said measured volume of ambient air of water vapor;

(B) contacting the said water vapor-freed measured volume of ambient air with vinyl acetate adsorbing means, said adsorbing means containing an inhibitor for vinyl acetate polymerizaton thereby separating the vinyl acetate monomer in the measured volume of ambient air from said ambient air;

(C) desorbing the adsorbed vinyl acetate monomer from said vinyl acetate adsorbing means; and

(D) measuring the amount of desorbed vinyl acetate with analytical means for assaying vinyl acetate.

4,292,043

PROCESS FOR WORKING UP EFFLUENT CONTAINING AMMONIUM SULPHATE

Gabriël Denecker, Heide-Kalmthout; Domien Sluyts, Stabroek; Roland Putseys, Heide-Kalmthout; Willy Van Herck; Ludo Claes, both of Braschaat, all of Belgium, and Georg Spott, Krefeld, Fed. Rep. of Germany, assignors to Bayer Antwerpen, Antwerp, Belgium

Filed Jan. 21, 1980, Ser. No. 113,893
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905779; Sep. 7, 1979, 2936153
Int. Cl.³ B01D *9/02;* C01C *1/24*
U.S. Cl. 23—296 **11 Claims**

1. A process for the working up of ammonium sulphate-containing effluent which is contaminated with organic compounds, comprising the steps of evaporating and crystallizing the effluent to produce water vapor which is removed, a concentrated liquid and a crystal suspension, thickening the suspension to obtain solid ammonium sulphate which is removed and liquid which is recycled to an earlier step, advancing the concentrated liquid to a crystallizer, introducing ammonia into the crystallizer to decrease the solubility of the ammonium sulphate, thickening the resulting ammoniacal crystal suspension to obtain ammonium sulphate solids which are removed and ammoniacal liquor which is advanced to a distillation step for recovery of ammonia.

4,292,044

SOLID FUEL

Ichiro Shibanai; Kouki Horikoshi, both of Tokyo, and Nobuyuki Nakamura, Kunitachi, all of Japan, assignors to Kyoshin Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 50,989, Jun. 22, 1979, abandoned. This application Apr. 4, 1980, Ser. No. 137,322
Claims priority, application Japan, Feb. 8, 1979, 54/12762
Int. Cl.³ C10L *5/00*
U.S. Cl. 44—1 R **11 Claims**

1. A solid fuel comprising a mixture of a liquid fuel and cyclodextrin or a cyclodextrin-containing decomposition product of starch, which mixture also includes a second combustible substance and a base.

11. A process for producing a solid fuel comprises the steps of:

(a) adjusting the pH of 100 liters of a 25% (W/V) starch suspension containing calcium chloride to 6.5;
(b) adding a bacterium liquefaction type amylase (10,000 units/gram) in an amount of 10 units/gram of starch;
(c) heating the mixture at 85°–95° C. for 15 minutes and at 130° C for 5 minutes;
(d) cooling the resulting liquefied starch to 60° C. and adjusting the pH to 8.5 by the addition of caustic soda;
(e) adding 30 units per gram of starch of cyclodextrin glycosyltransferase (30,000 units/gram) and 10 kg. of kerosene;
(f) agitating the mixture for 70 hours;
(g) adding 10 kg of powdered chaff; and
(h) drying the resulting mixture at 60° C. under reduced pressure with stirring.

4,292,045

MODIFICATION OF LIQUID HYDROCARBONS

Herbert Brooks, Twyford, and Frederick A. Waite, Farnham Common, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 5, 1980, Ser. No. 146,411

Claims priority, application United Kingdom, May 10, 1979, 16311/79

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—62 **9 Claims**

1. A method for dissolving, in a liquid aliphatic hydrocarbon fuel having a flash point not less than 90° F., a copolymer obtained from monomers consisting of (1) at least 75% by weight of tert-butylstyrene as one monomer, (ii) from 1% to 24% by weight of a second monomer selected from the acrylic and methacrylic esters of aliphatic monohydric alcohols containing from 1 to 4 carbon atoms, 2-ethoxyethyl methacrylate, acrylonitrile, vinyl acetate, styrene and vinyltoluene, and (iii) from 1% to 10% by weight of methacrylic acid as a third monomer, the aggregate of monomers (i), (ii) and (iii) being 100% and the copolymer having the following characteristics:
(a) it is soluble in AVTUR 50 aviation kerosene;
(b) a 0.3% by weight solution of the copolymer in AVTUR 50 aviation kerosene has a relative viscosity in the range 1.3 to 2.6 and a differential orifice flow rate in the range 3 to 7 ccs per 30 seconds,
the method consisting in the steps of (A) blending the copolymer in finely divided form with a hydroxylic liquid which is a non-solvent for the copolymer or only a weak swellant therefor but which is miscible to the extent of at least 1% by weight with the fuel; (B) mixing the blend of the copolymer and the hydroxylic liquid into the fuel so as to give a concentration of copolymer in the fuel of from 0.1% to 1% by weight; and (C) dissolving in the fuel so treated from 0.01 to 0.6 mole, based on each 100 g of copolymer present, of an amino compound selected from the group consisting of alkyl monoamines containing from 1 to 12 carbon atoms, alkanolamines containing from 4 to 10 carbon atoms, aromatic amines and heterocyclic amines.

4,292,046

DETERGENT COMPOSITIONS

Alfred B. Piotrowski, Woodbury, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 10, 1979, Ser. No. 65,703

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—63 **3 Claims**

1. A composition consisting essentially of major amount of a liquid hydrocarbon fuel having an initial boiling point of at least about 75° F. and an end boiling point of about 750° F., and a minor detergency improving amount of the reaction product of a bis-imidazoline and a (C_{18}–C_{24}) alkylsuccinic anhydride wherein said bis-imidazoline is obtained by reacting a dimer acid and 2-(2-aminoethylamino) ethanol under suitable reaction conditions in a 1 to 2 molar ratio.

4,292,047

BENZOQUINONE AND AMINE REACTION PRODUCT FOR FUELS AND MINERAL OILS

Paul F. Vartanian, and Joseph B. Biasotti, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,668

Int. Cl.³ C10L *1/18*; C10M *1/32*

U.S. Cl. 44—65 **4 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons within gasoline boiling range containing from about 0.005 to 0.20 weight percent of a reaction product prepared by reacting benzoquinone with an amine selected from the group consisting of N-oleyl-1,3-diaminopropane, N-lauryl-1,3-diaminopropane, N-soya-1,3-diaminopropane, and N-tallow-1,3-diaminopropane, said reaction product being prepared by reacting at least 1.5 moles of said amine per mole of said benzoquinone.

4,292,048

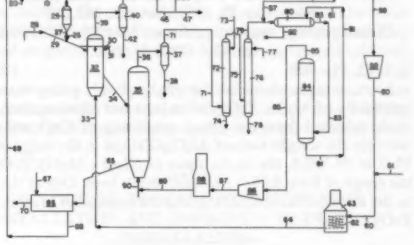
INTEGRATED CATALYTIC COAL DEVOLATILIZATION AND STEAM GASIFICATION PROCESS

Robert D. Wesselhoft, Baytown, and Daniel F. Ryan, Friendswood, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 21, 1979, Ser. No. 106,123

Int. Cl.³ C10J *3/54*

U.S. Cl. 48—197 R **11 Claims**



1. An integrated catalytic devolatilization and steam gasification process for the simultaneous production of hydrocarbon liquids and a methane-containing gas from carbonaceous feed solids which comprises:
(a) introducing said carbonaceous feed solids into a devolatilization zone;
(b) introducing a mixture of gases containing carbon monoxide and hydrogen into said devolatilization zone;
(c) contacting said carbonaceous feed solids in said devolatilization zone with said mixture of gases in the presence of a carbon-alkali metal catalyst at a temperature sufficiently high to devolatilize said carbonaceous feed solids but sufficiently low to prevent any substantial reaction of steam with said carbonaceous solids thereby producing char and a devolatilization effluent containing gaseous and vaporous constituents, wherein said carbon-alkali metal catalyst serves to catalyze the exothermic reaction of the carbon monoxide and hydrogen in said mixture of gases to form methane and wherein said temperature is sufficiently low that equilibrium in said devolatilization zone favors the formation of methane by said reaction of carbon monoxide and hydrogen and said reaction occurs to such an extent that substantially all of the heat required in said devolatilization zone is supplied by the heat given off by said reaction and by the sensible heat in the mixture of gases introduced into said devolatilization zone;
(d) treating said devolatilization zone effluent to recover

substantially tar free hydrocarbon liquids as product and a methane-rich gas;

(e) contacting at least a portion of said methane-rich gas with steam in a steam reforming zone under conditions such that at least a portion of the methane in said methane-rich gas reacts with steam to produce hydrogen and carbon monoxide;

(f) using the effluent from said steam reforming zone as the mixture of gases introduced into said devolatilization zone in step (b);

(g) passing said char produced in said devolatilization zone into a steam gasification zone;

(h) reacting said char with steam in said steam gasification zone under gasification conditions in the presence of a carbon-alkali metal catalyst and sufficient added hydrogen and carbon monoxide to provide substantially equilibrium quantities of hydrogen and carbon monoxide in said steam gasification zone at the gasification temperature and pressure;

(i) withdrawing from said steam gasification zone a raw product gas containing substantially equilibrium quantities, at the gasification temperature and pressure, of methane, carbon dioxide, steam, hydrogen, and carbon monoxide, wherein substantially none of said raw product gas is passed into said devolatilization zone; and

(j) recovering a methane-containing gas as product from said withdrawn raw product gas.

4,292,049

CERAMIC MATERIALS FOR HIGH-SPEED CUTTING

Hiroshi Tanaka, and Osamu Kato, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed May 27, 1980, Ser. No. 153,291

Claims priority, application Japan, May 25, 1979, 54-65476

Int. Cl.³ C04B *35/10*

U.S. Cl. 51—309 **4 Claims**

1. A ceramic material for high-speed cutting consisting essentially of Al_2O_3, ZrO_2 and at least one alkaline earth metal oxide selected from the group consisting of CaO and MgO, wherein the weight ratio of Al_2O_3/ZrO_2 is in the range of from 95/5 to 99.5/0.5, the molar ratio of $(CaO+MgO)/ZrO_2$ is in the range of from 0.05/1 to 0.2/1, and at least 50% of the ZrO_2 in the material is cubic ZrO_2, and the remainder is monoclinic ZrO_2.

4,292,050

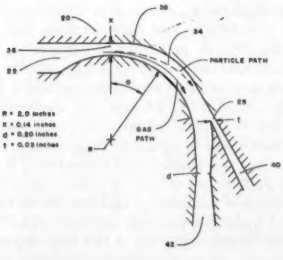
CURVED DUCT SEPARATOR FOR REMOVING PARTICULATE MATTER FROM A CARRIER GAS

Hans D. Linhardt, Newport Beach, and John H. Beveridge, San Clemente, both of Calif., assignors to Linhardt & Associates, Inc., Newport Beach, Calif.

Filed Nov. 15, 1979, Ser. No. 94,510

Int. Cl.³ B01D *45/12*

U.S. Cl. 55—1 **8 Claims**



5. A process for separating solid particles including particles smaller than 1.0 micron, from a carrying gas composition, the gas composition having at least one condensable gaseous component capable of condensation under operative conditions of the process, the process comprising the steps of:

passing the gas composition through a curved duct, a centrifugal force arising in the curved duct affecting the direction of travel of the particles in a different manner than the travel of gaseous components of the carrying gas composition;

accelerating the flow of the gas composition to a high velocity the lower limit of which is substantially Mach 1.0 whereby the static temperature of the gas composition becomes lower at the high velocity than prior to said acceleration and whereby at least a portion of the condensable component condenses on the solid particles initially smaller than approximately 1.0 micron, said small particles acting as condensation sites resulting in liquid particles of a size larger than 1 micron, said liquid particles entrapping said small solid particles;

causing a shock zone to occur in the high velocity flow of the gas composition whereby a flow path of the solid particles and of the condensed liquid particles entrapping said particles initially smaller than approximately 1.0 micron is further diverted from the flow path of the gaseous components, and

collecting said solid particles and liquid particles.

4,292,051

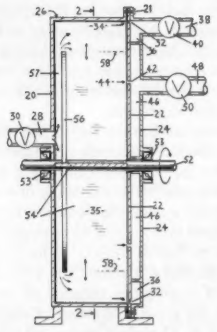
APPARATUS AND METHOD FOR CENTRIFUGAL FLUID SEPARATOR

Wellesley R. Kime, 8745 Appian Way, Los Angeles, Calif. 90046

Continuation-in-part of Ser. No. 25,276, Mar. 29, 1979, abandoned, Ser. No. 111,135, Jan. 10, 1980, abandoned, and Ser. No. 113,860, Jan. 21, 1980, abandoned. This application Feb. 21, 1980, Ser. No. 123,229

Int. Cl.³ B01D *59/20*

U.S. Cl. 55—17 **22 Claims**



1. An apparatus for centrifugally separating fluid having heavier and lighter fractions into a first portion having an increased concentration of the heavier fraction and a second portion having an increased concentration of the lighter fraction, comprising:

A. a stationary housing having an inlet end and an outlet end, the stationary housing defining a centrifugal chamber, the inlet end of the stationary housing having fluid inlet means for passage of fluid having heavier and lighter fractions into the centrifugal chamber, the outlet end of the stationary housing having a first outlet means for discharging a first portion of the fluid having an increased concentration of the heavier fraction peripherally from the centrifugal chamber and a second outlet means for discharging a second portion of the fluid having an increased concentration of the lighter fraction more centrally from the centrifugal chamber; and

B. a rotatable member having a shaft and plurality of attached, outwardly radiating centrifugal vanes for rapidly

rotating the fluid in the centrifugal chamber for providing centrifugal force for urging the heavier fraction peripherally for tending to displace the lighter fraction peripherally and urging the lighter fraction centrally for centrifugally separating the fluid into the first portion peripherally and the second portion more centrally in the centrifugal chamber.

12. A method for centrifugally separating a fluid having heavier and lighter fractions into a first portion having an increased concentration of the heavier fraction and a second portion having an increased concentration of the lighter fraction, comprising the steps of:

A. admitting fluid having heavier and lighter fractions into a centrifugal chamber defined by a stationary housing having an intake end and an outlet end;

B. rapidly rotating the fluid in the centrifugal chamber by a rotating member having a shaft and a plurality of outwardly radiating vanes extending to close proximity with the stationary housing for urging the heavier fraction peripherally for tending to displace the lighter fraction peripherally for forming a first portion of fluid having an increased concentration of the heavier fraction peripherally and forming a second portion of the fluid having an increased concentration of the lighter fraction centrally;

C. discharging the first portion of fluid through a first outlet means peripherally located in the outlet end of the stationary housing;

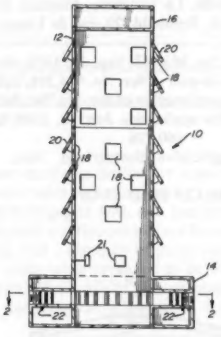
D. discharging the second portion of the fluid via a second outlet means more centrally located in the outlet end of the centrifugal housing;

4,292,052

AIR POLLUTION CONTROL DEVICE AND METHOD

John J. Cardullo, 707 Alter St., Philadelphia, Pa. 19147

Filed May 12, 1980, Ser. No. 149,069
Int. Cl.³ B01D *46/10*
U.S. Cl. 55—19 **7 Claims**



1. Apparatus for controlling air quality comprising:

(a) a base,

(b) an upwardly extending covered tower supported on said base having a plurality of air inlet openings, said openings being shielded from the weather by covering means,

(c) first means for monitoring the quality of air entering the tower through said air inlet openings,

(d) a plurality of air purification means located in said base to produce purified air, each of said air purification means having an air inlet in flow communication with said tower,

(e) each of said air purification means including an air outlet opening and located in said base for venting said purified air to the atmosphere,

(f) second means positioned and arranged with respect to each air purificaton means for monitoring the quality of said purified air before venting to the atmosphere through said air outlet openings,

(g) air moving means positioned and arranged with respect to each air purification means controlled by said second monitoring means and for creating a flow of air along a path from said air inlet openings downward through said tower and at least one of said air purification means and its associated air outlet opening,

(h) first gating means positioned and arranged with respect to each air purification means controlled by said second monitoring means and for controlling the flow of air into said air purification means, and

(i) second gating means positioned and arranged with respect to each air purification means controlled by said second monitoring means and for controlling the flow of air to the atmosphere through said outlet openings.

7. A method for controlling air quality comprising the steps of:

(a) creating a downward flow of air containing pollutants along a path through air inlet openings in a tower supported on a base through at least one of a plurality of air purification means in said base to the atmosphere through air outlet openings in said base positioned and arranged with respect to each air purification means;

(b) monitoring the quality of air flowing into said inlet openings by detecting the amount of pollutants contained in the air entering said tower;

(c) controlling the flow of air through at least one of said air purification means by an air inlet gating means;

(d) monitoring the quality of the air exiting said air purification means to determine the amount of pollutants remaining in the air;

(e) permitting the continued flow of purified air to the atmosphere when the amount of pollutants in the air exiting said air purification means is below a predetermined level; and

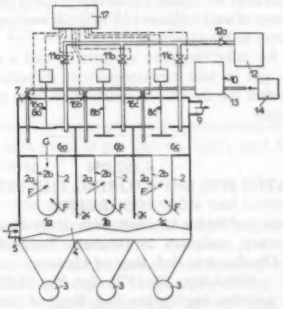
(f) terminating the flow of purified air through said outlet openings when the amount of pollutants in the air exiting said air purification means is above a predetermined level.

4,292,053

DECLOGGING PROCESS FOR FILTRATION INSTALLATION AND IMPROVED FILTRATION INSTALLATION

Jean Remillieux, Meudon-la-Foret, France, assignor to Air Industrie, Courbevoie, France

Filed Mar. 4, 1980, Ser. No. 127,070
Claims priority, application France, Mar. 5, 1979, 7905659
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—96 **14 Claims**



1. A method of declogging at least one filtration element of a filtration cell of a filtering installation for filtering a dust-laden gas, said installation comprising a plurality of filtration cells, each filtration cell comprising at least one filtering ele-

ment having an upstream face and a downstream face, said dust-laden gas passing through said filtering element from said upstream face to said downstream face whereby a layer of dust is deposited from said dust-laden gas on the upstream face of said filter element, said installation further comprising an outlet enclosure at the downstream face of said at least one filtering element and an inlet enclosure at the upstream face of said at least one filtering element, said method comprising the steps of:

isolating, from the flow of dust-laden gas, a filtration cell to be declogged, said filtration cell having at least one filtering element having a layer of dust;

admitting into the isolated cell a first flow of inert gas in a direction counter-current to the direction of flow of dust-laden gas such that the inert gas passes through said at least one filtering element in said filtration cell from the downstream face of the at least one element to its upstream face, the flow of at said inert gas being such that the inert gas first fills said outlet enclosure of said isolated cell, passes through the at least one filtering element and into the area of said inlet enclosure surrounding the at least one filtering element of said isolated cell without causing the dust layer thereon to be detached;

admitting into the isolated cell a second flow of inert gas in said counter-current direction, the flow of said second flow of inert gas being such that the dust layer is detached from said at least one element.

8. Filtration apparatus comprising:

a plurality of filtration cells, each filtration cell having at least one filtering element having an upstream face and a downstream face and through which passes, in use, a dust-laden gas flow from the upstream face to the downstream face;

an inlet enclosure for all the filtration cells, said inlet enclosure having a gas inlet and enclosing the upstream face of the at least one filtering element;

an outlet enclosure for each filtration cell, said enclosure having a gas outlet and being in flow communication with the at least one filtering element;

a collecting enclosure for all the filtration cells, said collecting enclosure communicating with each outlet enclosure through closure means controllable independently for each cell, said collecting enclosure being connected to a dust-free gas-discharge means;

means for isolating, from a flow of dust-laden gas, a filtration cell to be declogged;

means for admitting to an isolated filtration cell a first flow of inert gas in a direction counter-current to the direction of flow of dust-laden gas such that the inert gas passes through the at least one filtering element in said filtration cell from the downstream face of the at least one element to its upstream face, with a flow such that the inert gas first fills said outlet enclosure of said isolated cell, passes through the at least one filtering element and into the area of said inlet enclosure surrounding the at least one filtering element of said isolated cell without causing the dust layer thereon to be detached;

means for admitting into an isolated cell a second flow of inert gas in said counter-current direction with a flow such that the dust layer is detached from said at least one element.

4,292,054

APPARATUS FOR MONITORING THE TEMPERATURE OF ADSORBERS

Rolf Noack, and Stefan Gramelt, both of Oberhausen, Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

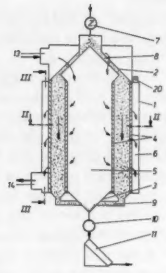
Filed Aug. 20, 1979, Ser. No. 68,057

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843627

Int. Cl.³ B01D *53/08*

U.S. Cl. 55—181 **8 Claims**

1. Apparatus for monitoring the temperature of adsorbers, comprising: a plurality of segments for holding a traveling carbonaceous fill between two perforated walls with gas flowing through the fill to be cleaned, a plurality of measuring elements arranged inside each of said segments on a gas outlet side, said measuring elements responding at a predetermined temperature, said measuring elements being distributed over height and width of an exit cross section of said adsorber, said measuring elements being electrically connected in series, said measuring elements having lead-ins connected to a power source, and indicator means connected to said lead-ins and



located outside each of said segments, a measuring element becoming actuated when the temperature exceeds a predetermined magnitude at a location in said exit cross section, said measuring element corresponding to said location in said exit cross section, actuation of said measuring element actuating thereupon said indicator means to indicate the temperature condition, whereby an intolerable temperature rise within said traveling carbonaceous fill held between said two perforated walls is prevented.

4,292,055

PURIFIER FOR GASEOUS FLUIDS

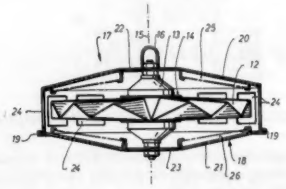
Pierre M. T. De Castella, La Vuachere, Monnaz, Switzerland (1111), and Charles L. Reinhold, 29, rue de Lancy, Carouge, Switzerland (1227)

Continuation of Ser. No. 943,563, Sep. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 924,391, Jul. 13, 1978, abandoned, which is a continuation of Ser. No. 742,763, Nov. 18, 1976, abandoned. This application Jun. 18, 1980, Ser. No. 160,726

Claims priority, application Switzerland, Nov. 25, 1975, 15239/75

Int. Cl.³ B01D *53/06*

U.S. Cl. 55—233 **27 Claims**



1. A gaseous fluid purifier, comprising a turbine which includes a motor and a rotor drivingly connected with the motor to be rotated thereby, the rotor comprising at least one rotary disc which is pleated in shape and which has a pleated surface when the rotor is rotated, the said pleated surface being rough and thereby able to retain particles from the flux of gaseous fluid which travels along the pleated surface, and the rotary disc being an adsorbent material that blocks the flux of the fluid and the particles from passing through the rotor, whereby, during the rotation thereof, the rotor performs a

ventilating function and the said pleated surface thereof performs a gaseous fluid filtering function; and means for positioning said rotor is communication with a gaseous fluid so that, when rotated, it will purify the gaseous fluid.

21. A gaseous fluid purifier, comprising at least two rotatable discs having a common axis of rotation and being spaced apart from each other along their common axis, the said discs having respective peripheries and centers and at least one of the discs being of conical shape broadening toward the other disc, said discs being oriented such that the distance between them at their peripheries is less than the distance between them at their centers; a central suction opening defined in at least one of the discs; said discs defining between them at their peripheries a peripheral outlet opening; both of the discs being comprised of a material having rough surfaces, whereby the discs have rough surfaces for adsorbing impurities in gaseous fluid passing over said surfaces when the discs are rotated about said common axis as a rotor; and a stack of annular sheets provided at the peripheries of the discs, the annular sheets of which are oriented generally parallel to the disc cross sections that are transverse to the said common axis and are comprised of a material having rough surfaces, whereby the annular sheets have rough surfaces; said annular sheets being impregnated with a chemical reagent adapted to bind particles of undesired gaseous components which are contained in the gaseous fluid to be purified.

4,292,056

ENDLESS PAINT SEPARATING MEMBER FOR PAINT SPRAY BOOTHS

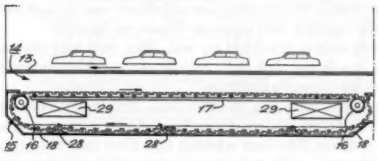
Ivan Bloomer, London, England, assignor to Carrier Drysys Limited, London, England

Filed Oct. 5, 1979, Ser. No. 82,187

Claims priority, application United Kingdom, Oct. 10, 1978, 39893/78

Int. Cl.³ B01D *45/08, 45/18, 46/22*

U.S. Cl. 55—243 **9 Claims**



9. A paint receiving device for removing paint from paint-laden air, said paint receiving device comprising a plurality of members interengaged with one another to define an endless and substantially continuous surface having a plurality of openings therein, and a plurality of plates supported by said members, each plate being arranged to be impinged on by the air flow through at least one of said openings for diverting the air flow such that paint carried by air is deposited on said plate.

4,292,057

TOP REMOVAL SUPPORT FOR DUST COLLECTOR BAGS

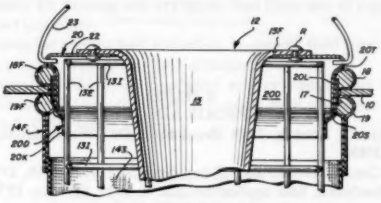
Edward A. Ulvestad, Naperville, and Charles M. Harris, Palatine, both of Ill., assignors to Flex Kleen Corp., Chicago, Ill.

Continuation of Ser. No. 617,710, Sep. 29, 1975, abandoned. This application Jul. 17, 1980, Ser. No. 169,641

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—302 **4 Claims**

1. In a reverse blow-back dust collector that includes a flat tube sheet having a plurality of closely spaced plain mounting openings, and a separate bag assembly for each mounting opening, each bag assembly including an elongated skeletal cage, an elongated bag having an open end portion to receive the cage therein, and an air nozzle to fit within the end of the cage, the improvement comprising an improved cage and nozzle mounting and support arrangement for each bag assembly comprising tube sheet sealing means including a sleeve of fabric material having a top fold region, an expansion type clamping means captively disposed within said top fold region for biasing said top fold region outwardly into direct sealing contact with the edge portion of one of said openings of said tube sheet and having upper and lower circular beads of soft resilient material in pressed engagement with said tube sheet above and below the same, and a removable top support structure projecting through said one of said openings and through



said sleeve and supporting said cage and said nozzle to extend generally below said tube sheet, said support structure including a flange portion presenting a substantially flat horizontal surface having an opening therethrough, a vertical collar portion for force fit seal reinforcing engagement with said top fold region, and a shoulder portion overlying said edge portion and said upper bead to transmit cage loads through said bead and onto the top side of said tube sheet, said nozzle being affixed to said flange portion and extending downwardly through the opening thereof.

4,292,058

SWIRL TUBE APPARATUS FOR SEPARATING GAS OR ISOTOPE MIXTURES

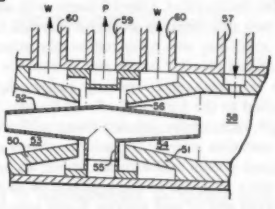
Eberhard Willeitner, Utting a. Ammersee, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg AG, Fed. Rep. of Germany

Filed Sep. 27, 1978, Ser. No. 946,219

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2743995

Int. Cl.³ B01D *45/12, 59/20*

U.S. Cl. 55—348 **5 Claims**



1. Swirl tube or chamber apparatus for separating an isotope or gas mixture of a process gas having heavy and light gas fractions, comprising,

a housing,

a plurality of swirl chambers disposed in said housing in an axially aligned relationship with an end of adjacent swirl chambers facing one another;

feed port means extending through said housing and comprising a plurality of ports tangentially issuing into the swirl chambers for feeding said process gas mixture thereto;

first extraction port means for extracting a heavy gas fraction from at least one end of said swirl chambers; and

second extraction port means for extracting a light gas fraction comprising common extraction means for extracting

said light gas fraction from said facing ends of adjacent swirl chambers, said common extraction means including extraction pipes projecting axially into said swirl chambers and being radially inwardly of said first extraction port means,

wherein said first and second extraction port means directly communicate with respective collection ducts formed in said housing for the withdrawal of the respective fractions extracted thereby.

4,292,059

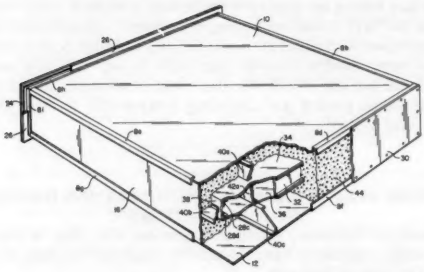
BY-PASS PROOF ADSORBER CELL

Julius L. Kovach, 2948 Brookdown Dr., Worthington, Ohio 43085

Continuation-in-part of Ser. No. 834,313, Sep. 19, 1977, abandoned. This application Jun. 9, 1980, Ser. No. 157,481

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—350 **10 Claims**



1. An adsorber module for housing particulate adsorbent material therein for adsorbing a sorbable component of a gas or vapor stream passed therethrough, comprising:

a. a rigid, rectangular, exterior frame with an upper, a lower, and two side foraminous sheets retained thereby; an exterior solid rear end plate removably attached to the rear end of said exterior frame; and an exterior solid front plate with a rectangular opening penetrating therethrough attached to the front end of said frame;

b. a rigid, rectangular, interior frame with an upper, a lower, and two side interior foraminous sheets retained thereby disposed within said exterior frame; an interior solid rear end plate attached to the rear end of said interior frame; the front end of said interior frame attached to said exterior solid front plate, the outlet chamber formed by said interior frame being coextensive in cross-sectional area with said rectangular opening in said exterior solid front plate; said interior and exterior frames, said interior and exterior rear end plates, and said interior and exterior foraminous sheets being in parallel but spaced-apart relationships to define a plenum chamber therebetween for housing said particulate adsorbent material; and

c. a plurality of rigid rib-like members disposed within said plenum chamber running from said interior rear plate to said exterior front plate to maintain and define said spaced-apart relationships and to further define sub-compartments of said plenum chamber which are in communication within said plenum chamber, at least one of said members being disposed between said exterior and said interior upper sheets and between said exterior and the interior lower sheets.

4,292,060

AIR-FILTER ASSEMBLY

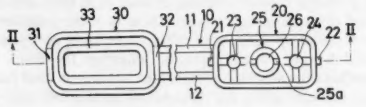
Naoji Sakakibara, Chiryu, and Nobuyuki Hashimoto, Toyota, both of Japan, assignors to Aisin Sieki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 2,176, Jan. 9, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,357

Claims priority, application Japan, Jan. 17, 1978, 53-3638

Int. Cl.³ B01D *50/00, 46/10*

U.S. Cl. 55—385 R **1 Claim**



1. An air filter assembly for connecting to a pipe member of a control valve of an exhaust emission cleaning system, comprising:

a filter case having an air filter therein and having a communicating hole connected to said pipe member;

a filter cap coupled with said filter case, wherein said filter case and said filter cap are made of elastic material and formed integrally with each other via at least one connecting member;

a projection vertically extending from the bottom of said filter case wherein said communicating hole comprises an inner, small diameter opening provided at the top of said projection, said projection including an inner conical surface portion connected to said small diameter opening, at least one longitudinal recess extending from the top of said projection towards said bottom of said filter case, and a transverse groove formed in said projection and cooperable with said pipe member so as to facilitate connection of said filter case to said pipe member;

air inlet means formed in either said filter case or said filter cap on opposite side portions of said projection;

projecting means provided on said filter case wherein said filter cap is coupled with said filter case by connection with said projecting means;

at least one connecting member, including an aperture for said projecting means, formed integrally with said filter case and said filter cap wherein said filter case is coupled to said cap by said at least one connecting member; and

a rib portion provided on said filter cap to hold said air filter, whereby said air filter can be simply and quickly assembled and replaced.

4,292,061

AIR CLEANER FOR FUEL INJECTED ENGINES

Charles M. Land, 14 Valencia, Apt. 5, San Rafael, Calif. 94901

Filed Apr. 25, 1980, Ser. No. 143,945

Int. Cl.³ B01D *46/40*

U.S. Cl. 55—493 **4 Claims**

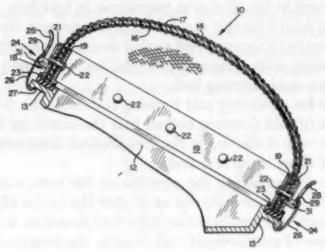
1. An air filter for a fuel injected engine having a generally rectangular opening for air intake and a filter seat flange surrounding the opening, comprising:

a rigid generally rectangular collar forming a base for the filter;

a filtering element of soft, porous foam material secured to and extending from side to side and end to end on the rigid collar, the element extending outwardly in a generally arcuate configuration between the sides of the collar, with an approximate inner side radius of between about 0.5 and about 1.0 times the inner width of the element at the collar;

an air passing structural backing for the filtering element in the same generally arcuate shape, secured to the collar and included at both the inner side and the outer side of the filtering element,

the collar comprising spaced inner and outer bands, with the filtering element and two layers of backing extending into the collar between the bands, and fasteners passing through the bands and retaining the filter element and backing together and to the collar;



a generally rectangular gasket secured to the collar in position to engage the filter seat flange; and

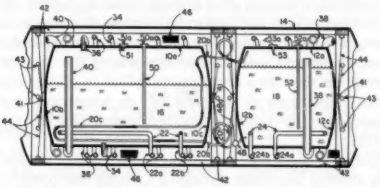
means for securing the collar to the filter seat flange of the engine.

4,292,062

CRYOGENIC FUEL TANK

Horia A. Dinulescu, 1615 S. 4th St., #M2904, Minneapolis, Minn. 55454, and Nicholas A. Sanders, 109½ E. 2nd St., Hastings, Minn. 55033

Filed Mar. 20, 1980, Ser. No. 132,140
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—7 **34 Claims**



1. A cryogenic fuel tank for use with an engine which when operating consumes the cryogenic fuel, the fuel tank comprising:

a fluid-tight cryogenic fuel container having first and second ends and containing a quantity of cryogenic fuel,

a fluid-tight secondary cryogenic fluid container having first and second ends and containing a quantity of secondary cryogenic fluid,

a refrigeration system comprising a high temperature heat exchanger, a low temperature heat exchanger, a compressor, an expander and refrigeration working fluid,

said high temperature heat exchanger being located in said cryogenic fuel container and being part of said refrigeration system,

said low temperature heat exchanger being located in said secondary cryogenic fluid container and being part of said refrigeration system,

said refrigeration system periodically transferring heat from said secondary cryogenic fluid to said cryogenic fuel when said engine is consuming said cryogenic fuel,

a heat exchange bridge passing through said cryogenic fuel container and being connected to said secondary cryogenic fluid container,

said heat exchange bridge periodically transferring heat from said cryogenic fuel to said secondary cryogenic fluid when said engine is not consuming said cryogenic fuel,

a fluid-tight outside shell having first and second ends and enclosing said cryogenic fuel container and said secondary cryogenic fluid container,

a means of supporting said cryogenic fuel container and said secondary cryogenic fluid container within said outside shell,

a means for filling said cryogenic fuel container with said cryogenic fuel,

a means for extracting said cryogenic fuel from said cryogenic fuel container,

a means for filling said secondary cryogenic fluid container with said secondary cryogenic fluid,

a means for venting said cryogenic fuel from said cryogenic fuel container,

a means for venting said secondary cryogenic fluid from said secondary cryogenic fluid container,

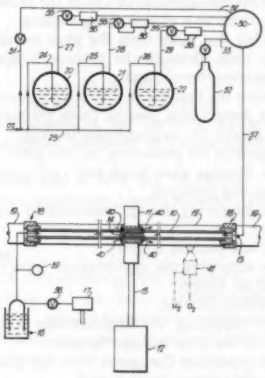
a means for thermally insulating said cryogenic fuel container and said secondary cryogenic fluid container and said refrigeration system.

4,292,063

MANUFACTURE OF AN OPTICAL FIBER PREFORM WITH MICRO-WAVE PLASMA ACTIVATED DEPOSITION IN A TUBE

Koichi Abe, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 5, 1980, Ser. No. 146,522
Int. Cl.³ C03B *37/075*
U.S. Cl. 65—3.12 **16 Claims**



1. A method of manufacturing an optical fiber preform, comprising:

providing a glass tube;

positioning said tube in a microwave cavity;

feeding a carrier gas through said tube;

applying a microwave field to said cavity to produce a plasma in said tube at a position in said cavity, the power supplied being sufficient to maintain a temperature on the inner wall of said tube below about 500° C.;

feeding a reactant gas containing silica in a vaporous form through said tube;

reciprocating said tube through said cavity for a predetermined plurality of times to build up a deposit of particulate silica on the inner wall of said tube;

heating said tube to provide a temperature on the inner wall of said tube of about 1500° C. to 1700° C.; and

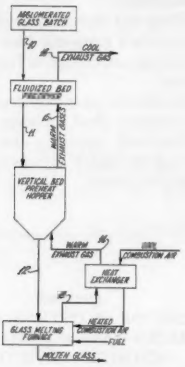
traversing the tube through said cavity to fuse said deposit to form a fused layer of silica.

4,292,064

GLASS BATCH FEEDING USING A FLUIDIZED BED FOR PREDRYING AGGLOMERATES

Mark A. Propster, Gahanna, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 31, 1980, Ser. No. 135,950
Int. Cl.³ C03B *3/00*
U.S. Cl. 65—27 **7 Claims**



1. A glass manufacturing process comprising the steps of:
forming liquid-containing glass batch agglomerates;
charging the agglomerates to a predrying fluidized bed,
withdrawing the agglomerates from the fluidized bed and charging them to a preheat hopper;
withdrawing the agglomerates from the preheat hopper and feeding them to a glass melting furnace;
withdrawing flue gases from the glass melting furnace and passing them through the preheat hopper to heat the agglomerates therein; and
withdrawing the flue gases which have passed through the preheat hopper and passing them through the fluidized bed to predry the agglomerates therein.

5. An apparatus for producing molten glass comprising:
means for forming glass batch into agglomerates;
a fluidized bed predryer;
means for supplying the agglomerates to the fluidized bed predryer;
a vertical bed preheat hopper;
means for supplying the agglomerates from the predryer to the preheat hopper;
a glass melting furnace;
means for supplying the agglomerates from the preheat hopper to the glass melting furnace;
means for supplying flue gases from the glass melting furnace to the preheat hopper; and
means for supplying flue gases from the preheat hopper to the predryer.

4,292,065

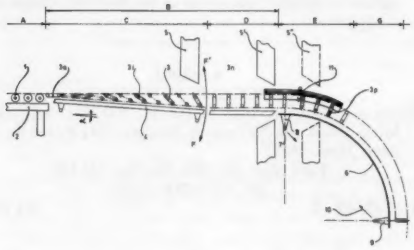
METHOD AND APPARATUS FOR SHAPING THERMOPLASTIC SHEET MATERIAL

Maurice Nedelec, Versailles; Claude Presta, Courbevoie, and Francois Vitoux, Thourotte, all of France, assignors to Saint Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 27, 1979, Ser. No. 97,683
Claims priority, application France, Nov. 27, 1978, 78 33478
Int. Cl.³ C03B *23/025*
U.S. Cl. 65—104 **25 Claims**

1. Apparatus for bending to a predetermined curvature a sheet of material in the plastic state, such as a sheet of glass brought to the softening temperature, comprising:
means for conveying said sheet in a first direction;
a forming bed comprising a plurality of curved forming rods, said rods having aligned end sections forming respective longitudinal axes and a curved center section extending away from said longitudinal axis;
means for mounting at least some of said curved rods with their longitudinal axes generally transverse to said first direction and their curved sections inclined at an angle to said first direction, thereby defining a surface that is curved in the direction transverse to said first direction;
means for mounting the forming rod nearest the upstream side of said forming bed so that an envelope defined by the forming rods is tangential to the surface of said sheet as it enters said forming bed;
means for mounting said forming rods near the downstream side of said forming bed so that the envelope defined by said rods is curved in the longitudinal direction in which said sheet is moved; and
means for adjusting the position of the rods which define said curved envelope so as to alter the radius of curvature of said envelope in the longitudinal direction, whereby the radius of curvature of said sheet in the longitudinal direction is also altered.

15. A method for bending and tempering sheets of material in the plastic state, such as a sheet of glass brought to the



softening temperature, in which said sheets are heated, bent, and them tempered, said method comprising the steps of:
heating the sheet to a temperature which is at least equal to the temperature at the start of the tempering step and maintaining said sheet at said temperature for an extended period;
bending the sheet while the sheet is held at said temperature by moving said sheet through a forming bed comprising a plurality of curved forming rods, said rods having aligned end sections forming respective longitudinal axes and a curved center section, said rods being mounted with their longitudinal axes generally transverse to the direction of movement of said sheets, some of said rods being mounted with their curved sections inclined at an angle to said direction of movement of said sheets and said rods near the downstream end of said forming bed being mounted at different heights with respect to one another, whereby an envelope is defined having a transverse curvature profle and a longitudinal curvature profile that change progressively in the direction of advancement of the sheet; and
tempering the sheet immediately after bending by subjecting it to a uniform blowing action.

4,292,066

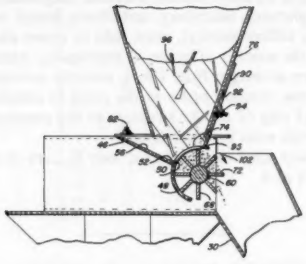
MATERIAL FEEDER

Melvin L. Barrett, P.O. Box 1492, Henderson, N.C. 27536

Filed Jun. 10, 1980, Ser. No. 158,350
Int. Cl.³ C03B *3/00*
U.S. Cl. 65—335 **6 Claims**

1. A material feed structure including body means defining a pair of spaced opposing upstanding surfaces, ramp means defining an inclined ramp surface extending between said upstanding surfaces and including a lower marginal edge, a partial cylindrical wall extending axially between said upstanding surfaces and opening in a generally horizontal direction

between and paralleling said upstanding surfaces, said partial cylindrical wall including an upper marginal portion registered with the lower marginal edge of said inclined ramp surface, a generally radially partitioned feed wheel journaled between said upstanding surfaces and having one side thereof closely embraced by said partial cylindrical wall, drive means drivingly connected to said feed wheel for driving the latter in a direction to move the upper radial partitions thereof in the general direction in which said partial cylindrical wall opens, a gravity discharge outlet spaced above said wheel and the area between said upstanding surfaces above the lower portion of



said inclined ramp surface, said gravity discharge outlet including a vertically adjustable abutment plate slidingly received and extending between said upstanding surfaces on the side of said outlet facing in the direction in which said partial cylindrical wall opens, and adjustable toward and away from the outer periphery of said wheel, means supporting said gravity discharge outlet in position relative to said upstanding surfaces, ramp and wheel for back and forth adjustable shifting of said gravity discharge outlet along a path generally paralleling the direction in which said partial cylindrical wall opens and transversely of the axis of rotation of said feed wheel.

4,292,067

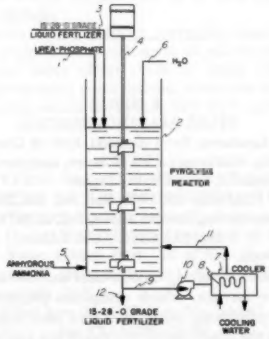
PRODUCTION OF UREA-AMMONIUM POLYPHOSPHATES FROM UREA PHOSPHATE

John M. Stinson, Sheffield, and James R. Burnell, Killen, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 71,436, Aug. 31, 1979, now Defensive Publication No. T998,001. This application Feb. 12, 1980, Ser. No. 120,949

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—29 **18 Claims**



BATCH PRODUCTION OF UREA-AMMONIUM POLYPHOSPHATES FROM UREA-PHOSPHATE

1. A batch process for the production of high-purity urea ammonium polyphosphate liquid which process consists essentially of the steps of:

(1) combining a predetermined portion of crystalline urea phosphate in a reaction vessel together with a predetermined portion of said high-purity urea-ammonium polyphosphate liquid, said predetermined portion of said urea-ammonium polyphosphate liquid being of sufficient quantity to impart fluidity into the resulting mixture of same with said crystalline urea phosphate;

(2) subsequently introducing into said reaction vessel a predetermined quantity of anhydrous ammonia, said predetermined quantity of anhydrous ammonia being sufficient to provide heat of reaction to raise the temperature of the resulting mixture in said reaction vessel from about the ambient temperature of the materials introduced thereinto up to the range of about 220° F. to about 300° F. to effect the condensation of said urea phosphate and thereby yield a resulting melt of urea-ammonium polyphosphate, and said predetermined quantity of anhydrous ammonia limited so as to substantially eliminate loss of unreacted portions thereof from said reaction vessel;

(3) subsequently adding water to said reaction vessel in predetermined quantities sufficient to dissolve said urea-ammonium polyphosphate to effect the production of a high-purity urea-ammonium polyphosphate liquid;

(4) subsequently subjecting at least a portion of said high-purity urea-ammonium polyphosphate liquid to cooling means; and

(5) subsequently removing at least a portion of the resulting cooled high-purity urea-ammonium polyphosphate liquid from said reaction vessel as product.

4,292,068

HERBICIDAL METHOD

Samuel D. van Hoogstraten, and David H. K. Davies, both of Cambridge, England, assignors to Fisons Limited, London, England

Filed Dec. 4, 1979, Ser. No. 99,723

Claims priority, application United Kingdom, Dec. 16, 1978, 48811/78

Int. Cl.³ A01N *43/08, 43/12*

U.S. Cl. 71—88 **10 Claims**

1. A method of combating rhizomatous or stoloniferous weeds, in which 2,3-dihydro-3,3-dimethylbenzofuran-5-yl ethanesulphonate is applied to a locus at which said weeds are growing or are liable to grow, in an amount sufficient to exert its herbicidal effect.

4,292,069

ARYLTHIOUREIDO PYRIDINECARBAMINO COMPOUNDS AND USE AS PLANT GROWTH REGULANTS

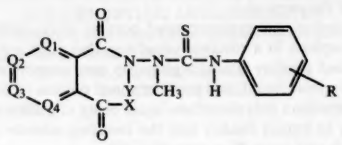
Jerry L. Rutter; Charles G. Gibbs, both of Shawnee Mission, and Loren W. Hedrich, Overland Park, all of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 101,654, Dec. 10, 1979. This application Jan. 23, 1981, Ser. No. 227,825

Int. Cl.³ A01N *43/40*

U.S. Cl. 71—94 **42 Claims**

1. The method of regulating the growth of plants, including combating unwanted vegetation, comprises applying to the plants, either on seed, the soil or directly on the plants an effective amount of a compound having the general structural formula:



in which

Q_1, Q_2, Q_3 or Q_4 is N,

X is —OH or —O—(C_1–C_4 alkyl) and Y is H or X and Y together represent a bond between carbon and nitrogen atoms and

R is H or one or two of the following substituents: —Br, —Cl, —F, —I, —CF_3, —CH_3, —NO_2 or —C≡N or an agriculturally acceptable salt thereof.

4,292,070

N-SUBSTITUTED TETRAHYDROPHTHALIMIDE AND HERBICIDAL COMPOSITION

Osamu Wakabayashi, Kawasaki; Kuni Matsuya, Zama; Hiroki Ohta, Machida; Tetsuo Jikihara, Kawasaki, and Seiichi Suzuki, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

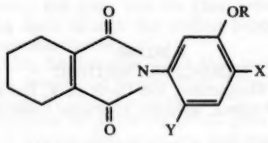
Filed Mar. 24, 1980, Ser. No. 133,270

Claims priority, application Japan, Apr. 13, 1979, 54-44948; Apr. 13, 1979, 54-44951

Int. Cl.[3] **A01N** *43/38;* **C07D** *209/48*

U.S. Cl. 71—96 **14 Claims**

1. A herbicidal composition comprising N-substituted-3, 4, 5, 6,-tetrahydrophthalimides which are represented by the formula:



(I)

wherein X represents a chlorine or bromine atom: Y represents chlorine or hydrogen atom; wherein R represents a C_3–C_4 alkenyl group, a C_3–C_4 alkynyl group, or a C_5–C_6 cycloalkyl group, as an active ingredient, and a carrier, wherein said active ingredient is in a range of 0.5 to 80 weight % of the herbicidal composition.

4,292,071

ISOTHIOUREIDO ISOINDOLEDIONES AND USE AS PLANT GROWTH REGULATORS

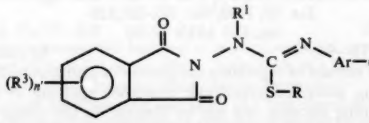
Joel L. Kirkpatrick, Washington Crossing, Pa.; Natu R. Patel, Overland Park, Kans., and Jerry L. Rutter, Mentor, Ohio, assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 35,875, May 3, 1979, abandoned. This application Apr. 10, 1980, Ser. No. 133,888

Int. Cl.[3] **A01N** *43/38;* **C07D** *209/48*

U.S. Cl. 71—96 **6 Claims**

1. The method of regulating the growth of plants comprising applying to the plants, the seed or the soil an effective amount of a compound which has the structural formula:



In which R is cyano, C_1 to C_4 alkyl, C_3 to C_5 alkenyl or fluoroalkenyl, propynyl, phenylallyl or C_1 to C_3 alkyl to which is attached a phenyl, bromophenyl, chlorophenyl, methylphenyl, pyridyl, benzoyl, trimethylacetyl, phenoxy, chlorophenoxy, methylthio, fluorobenzoyl, N-phenylcarbamyl, N-ethylcarbamyl, N-trifluoromethylthiadiazolylcarbamyl, carboxy or carbethoxy substituent,

R^1 is H, acetyl, C_1 to C_3 alkyl, alkenyl or alkynyl to which may be attached phenyl, halophenyl, carbethoxy, vinyloxy or phenoxy groups, or R and R^1 together may be C_2 to C_4 alkylene;

Ar is phenyl or benzoyl;

R^2 is C_1 to C_4 alkyl, alkoxy, alkylene, alkylamino or alkylthio; phenoxy, benzyloxy, carbalkoxy, acetyl, methylenedioxy, trifluoromethyl, nitro, halo or cyano and n represents the number of points of attachment, which may be zero or an integer from 1 to 4, with the provision that at least one position ortho to the point of attachment of a phenyl ring of the Ar structure to the remainder of the molecule must be unsubstituted;

R^3 is lower alkyl or halo and n' may be zero or an integer from 1 to 4.

4,292,072

NOVEL α-ISOCYANOCARBOXYLIC ACID COMPOUNDS AND PLANT GROWTH REGULANT COMPOSITIONS

Rolf Schröder, Wuppertal, and Klaus Lürssen, Berg. Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

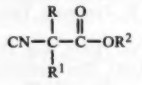
Filed Oct. 27, 1978, Ser. No. 955,435

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1977, 2751783

Int. Cl.[3] **A01N** *37/34*

U.S. Cl. 71—105 **5 Claims**

1. Plant growth regulant compositions comprising an agriculturally acceptable carrier and, in effective amounts, a salt of α-isocyanocarboxylic acid of the formula



wherein R and R^1 together represent an alkylene chain of 2 carbon atoms and R^2 is an alkali metal ion.

4,292,073

STEEL MAKING PROCESS

Katsukiyo Marukawa; Syoji Anezaki, both of Ibaraki, and Seiichi Masuda, Nishinomiya, all of Japan, assignors to Sumitomo Metal Industries, Inc., Osaka, Japan

Filed May 29, 1980, Ser. No. 154,216

Claims priority, application Japan, Jul. 3, 1979, 54-84522

Int. Cl.[3] **C21C** *5/32, 5/34*

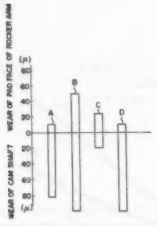
U.S. Cl. 75—60 **3 Claims**

1. A process for making carbon steel and low-alloy steel in a basic oxygen furnace, which comprises preparing a molten suitable for producing the steel in said basic oxygen furnace, carrying out the top-blowing of oxygen gas and bottom-blowing of carbon dioxide gas and then tapping the resulting molten steel, characterized in that the top-blowing oxygen is injected through a lance onto the molten metal at an outlet velocity of Mach 0.8–2.0.

4,292,074
WEAR RESISTANT ALLOY

Yoshiro Komiyama, Okazaki; Katsumi Kondo, Toyota; Yoshio Fuwa, Toyota; Akira Matsui, Toyota; Shoji Miyazaki, Toyota, and Tokushiro Hasegawa, Ootsu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 970,968, Dec. 19, 1978, abandoned, which is a continuation of Ser. No. 835,970, Sep. 28, 1977, abandoned. This application Aug. 31, 1979, Ser. No. 71,578
Claims priority, application Japan, May 24, 1977, 52-60064
Int. Cl.[3] C22C *30/00*
U.S. Cl. 75—122 1 Claim



1. A wear-resistant alloy consisting essentially of about 30%–60% Ni, 6%–10% Si, 0.5%–3% B, 0.5%–2% C, 2%–8% of carbide and boride forming elements selected from the group consisting of Cr, Mo, and W, and 30%–60% Fe.

4,292,075
SLOW FADE INOCCULANT AND A PROCESS FOR THE INOCCULATION OF MELTED CAST IRON

Friedrich Wolfsgruber, Tacherting; Hans W. Kasel, Saarbrücken-Bischmisheim; Manfred H. A. Odendahl, Saarbrücken-Brebach, and Wolfram W. Mörsdorf, Saarbrücken-Bischmisheim, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg and Halbergerhutte GmbH, Saarbrucken, both of, Fed. Rep. of Germany

Filed Nov. 2, 1979, Ser. No. 90,719
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1978, 2847787; Oct. 9, 1979, 2940946
Int. Cl.[3] C22C *33/08*
U.S. Cl. 75—130 R 14 Claims

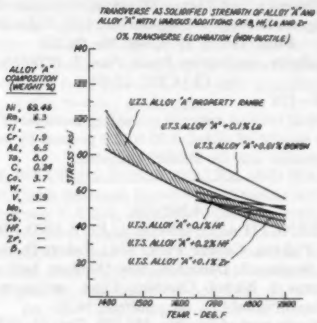
1. An inocullant for melted cast iron comprising:
(a) a silicon-containing matrix of iron-silicon alloys and having a crystal structure,
(b) a high-melting point calcium aluminum silicate compound, present in the matrix crystal structure, and
(c) a dicalcium aluminum silicate material with up to 20% by weight of silicon carbide and up to 10% by weight of calcium carbide,
the weight ratio of the calcium-containing matrix with the high-melting point calcium aluminum silicate to the dicalcium silicate material being about 1:0.05 to about 1:0.2 and the amount of high-melting point calcium aluminum silicate in the silicon-containing matrix being 5 to 30% by weight.

4,292,076
TRANSVERSE DUCTILE FIBER REINFORCED EUTECTIC NICKEL-BASE SUPERALLOYS

Michael F. X. Gigliotti, Scotia; Melvin R. Jackson, Niskayuna; Michael F. Henry; David A. Woodford, both of Schenectady; Sherwin S. Yang, Clifton Park, all of N.Y., and Charles A. Bruch, Cincinnati, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1979, Ser. No. 34,167
Int. Cl.[3] C22C *19/03*
U.S. Cl. 75—170 10 Claims

6. An alloy capable of developing a unidirectionally solidified anisotropic article containing an aligned eutectic reinforcing fibrous phase having improved transverse ductility and strength properties, the alloy consisting essentially of on a weight basis, 0.001–0.02 B, 0–9% Re, 0–<0.8% Ti, 0–20% Cr,

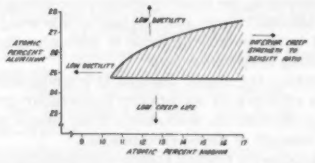


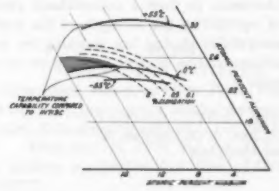
0–10% Al, 3–15% Ta, 0.1–1% C, 0–20% Co, 0–20% W, 0–7% V, 0–10% Mo, 0–3% Cb, <0.15% Hf, 0–1.5% Zr, the balance being essentially Ni and incidental impurities.

4,292,077
TITANIUM ALLOYS OF THE Ti_3Al TYPE

Martin J. Blackburn, Kensington, and Michael P. Smith, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 25, 1979, Ser. No. 60,264
Int. Cl.[3] C22C *14/00*; C21D *1/00*
U.S. Cl. 75—175.5 7 Claims





1. A titanium aluminum alloy which may be cast and forged, having at least 1.5% tensile ductility at room temperature and good elevated temperature creep strength, consisting essentially by atomic percent of 25–27 Al, 12–16 Nb, balance Ti (nominally by weight, 13.5–15.3 Al, 23.4–30 Nb, balance Ti).

4,292,078
ELECTRICAL CONTACT MATERIAL

Sinya Honda, Kasuga; Takeshi Komura, Fukuoka; Naomi Sugita, Fukuoka, and Tatuya Okamoto, Fukuoka, all of Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

Filed Nov. 5, 1979, Ser. No. 91,301
Claims priority, application Japan, Nov. 7, 1978, 53-137653
Int. Cl.³ C22C *27/04*
U.S. Cl. 75—176 **1 Claim**

1. Electrical contact material consisting essential of 10 to 20 percent by weight of nickel, 0.05 to 2.0 percent by weight of titanium diboride and the balance tungsten.

4,292,079
HIGH STRENGTH ALUMINUM ALLOY AND PROCESS

Joseph R. Pickens, College Park, Md.; Robert D. Schelleng, Suffern; Stephen J. Donachie, New Windsor, both of N.Y., and Thomas J. Nichol, Cheshire, Conn., assignors to The International Nickel Co., Inc., Suffern, N.Y.

Continuation-in-part of Ser. No. 951,590, Oct. 16, 1978. This application Oct. 4, 1979, Ser. No. 81,868
Int. Cl.³ B22F *3/00*; C22C *21/06*
U.S. Cl. 75—232 **23 Claims**

1. An oxide dispersion-strengthened mechanically alloyed aluminum-base alloy having a composition consisting essentially, by weight, of magnesium in a small but effective amount for increased strength up to about 7%, about 0.3% up to about 4% oxygen, up to about 2½% carbon, and the balance essentially aluminum, and characterized by a tensile strength (UTS) at room temperature above 66.3 ksi.

13. A process for working an oxide dispersion-strengthened mechanically alloyed aluminum-magnesium powder at elevated temperature to produce a consolidated worked product, said aluminum-magnesium power having a composition consisting essentially, by weight, of magnesium in a small but effective amount for increased strength up to about 7%, about 0.3% up to about 4% oxygen, up to about 2½% carbon, and the balance essentially aluminum, and characterized by a tensile strength (UTS) at room temperature of above 66.3 ksi and said powder having in compacted form a working temperature-strength profile which includes a critical working temperature-strength transition zone characterized by a sharp lowering of room temperature strength relative to increased working temperature, comprising:

(a) determining the working temperature-strength profile of the selected charge material, said profile being characterized by an overall decrease in strength relative to the working temperature; and

(b) working the charge material at a temperature selected with reference to the working temperature-strength profile to optimize the workability of the charge material and the strength of the worked product.

23. A process for treating a dispersion-strengthened mechanically alloyed aluminum containing, by weight, from about 2% up to about 7% Mg, up to about 2½% C, and from 0.3 up to about 4% O, by a method including steps comprising hot working said aluminum to form a consolidated product, the improvement of optimizing the strength of the consolidated product and workability during hot working by employing processing conditions in the interrelationship set forth by the following formula:

$$UTS = 0.059T_1 - 0.014T_2 - 0.034T_3 - 0.55E_R + 11.5(\text{wt. \% O}) + 20.1(\text{wt. \% C}) - 0.18\dot{\epsilon} - 3t + 214.6$$

where

UTS = Ultimate Tensile Strength in ksi (at room temperature)

T_1 = Degas Temperature

T_2 = Compaction Temperature

T_3 = Extrusion Temperature

E_R = Extrusion Ratio, which is the ratio of the cross sectional area of the extruded billet to the cross sectional of the extruded rod.

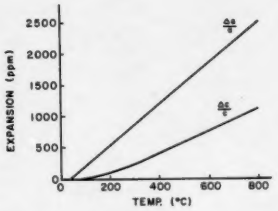
$\dot{\epsilon}$ = Strain Rate (sec^{-1})

t = Time at highest degassing temperature (hours).

4,292,080
CESIUM-STUFFED CORDIERITE CERAMICS

Francis W. Martin, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jun. 5, 1980, Ser. No. 156,666
Int. Cl.³ C03C *3/22*
U.S. Cl. 501—4 **2 Claims**



1. A ceramic body, wherein the crystal phase consists essentially of cesium-stuffed, hexagonal cordierite, demonstrating a use temperature up to about 1600° C. and nearly isotropic axial thermal expansions consisting essentially, by weight on the oxide basis, of about 11–13% MgO, 34–36% Al_2O_3, 33–42% SiO_2, and 10–22% Cs_2O.

4,292,081
BORIDE-BASED REFRACTORY BODIES

Tadahiko Watanabe, Saga, and Shinichi Kono, Ikoma, both of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 5, 1980, Ser. No. 127,434
Claims priority, application Japan, Jun. 7, 1979, 54-72779; Aug. 23, 1979, 54-99220
Int. Cl.³ C04B *35/58*
U.S. Cl. 501—96 **6 Claims**

1. A sintered refractory body which comprises

(a) from 99.99 to 60% by weight of at least one metal diboride selected from the group consisting of titanium diboride, chromium diboride, tantalum diboride, manganese diboride, molybdenum diboride, yttrium diboride, vanadium diboride, hafnium diboride, niobium diboride, aluminum diboride and zirconium diboride,

(b) from 0.01 to 40% by weight of at least one metal boride selected from the group consisting of MnB, Mn_3B_4, Mn_2B, Mn_4B, TiB, Ti_2B_5, Ti_2B, W_2B_5 and Mo_2B_5, and

(c) from 0.001 to 30% by weight of a binder ingredient selected from the group consisting of NiB, Ni_4B_3, Ni_2B, Ni_3B, FeB, Fe_2B, CoB, Co_2B, Co_3B and an alloy of nickel and phosphorus composed of 3 to 25% by weight of phosphorus and 97 to 75% by weight of nickel.

4,292,082
UNSHAPED REFRACTORIES

Hiroyuki Danjyo; Shigeru Okuda, both of Bizen, and Eiichi Yorita, Taiyo, all of Japan, assignors to Shinagawa Refractories Co. Ltd., Japan

Filed Jan. 31, 1980, Ser. No. 117,233
Claims priority, application Japan, Feb. 2, 1979, 54-10332
Int. Cl.³ C04B *35/52*
U.S. Cl. 501—100 **17 Claims**

1. An unshaped refractory comprising aggregate, refractory fine powder, granules, and a binder, said granules comprising a

refractory fine powder mixed with adhering carbonaceous material.

4,292,083

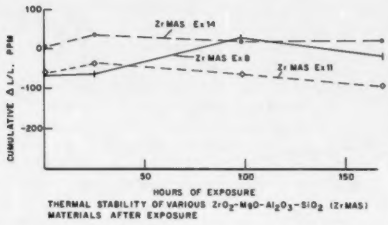
HIGH TEMPERATURE, LOW EXPANSION, CORROSION RESISTANT CERAMIC AND GAS TURBINE

Harry W. Rauch, Sr., Lionville, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 18, 1980, Ser. No. 141,507

Int. Cl.³ C04B *35/04, 35/10, 35/14, 35/48*

U.S. Cl. 501—104 **12 Claims**



THERMAL STABILITY OF VARIOUS ZrO_2-MgO-Al_2O_3-SiO_2 (Zr-MAS) MATERIALS AFTER EXPOSURE

1. A high temperature, low expansion, corrosion resistant ceramic material consisting essentially of about 3–13 weight percent MgO, about 29–44 weight percent Al_2O_3, about 40–51 weight percent SiO_2, and about 3–17 weight percent ZrO_2.

4,292,084

VIBRATABLE PLASTIC REFRACTORY

Stephen W. Thrower; George H. Criss, both of Bethel Park, and Thomas R. Kleeb, Pittsburgh, all of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 922,627, Jul. 7, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,509

Int. Cl.³ C04B *35/10, 35/18, 35/48*

U.S. Cl. 501—107 **8 Claims**

1. A vibratable plastic refractory composition consisting essentially of about 2 to 40%, by weight, calcined kaolin and the balance at least one non-basic calcined refractory aggregate selected from the group consisting of calcined bauxite, tabular alumina, calcined alumina, calcined fireclay, crushed refractory brick bats, zircon and mullite, said composition containing P_2O_5 in an amount equivalent to that provided by about 2 to 17% phosphoric acid of 85% concentration, the composition having a −325 mesh fraction between about 30 and 45%.

4,292,085

METHOD FOR CONVERTING INTO A NON-POLLUTING PARTICULATE PRODUCT THE FERROUS SULPHATE OBTAINED IN THE PRODUCTION OF TITANIUM DIOXIDE BY THE SULPHATE PROCESS

Luigi Piccolo, Milan; Tullio Corsini, Sesto Calende; Antonio Paolinelli; Gaudenzio Ferri, both of Milan, and Angelo La Rovere, Seveso, all of Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed Sep. 14, 1979, Ser. No. 75,446

Claims priority, application Italy, Sep. 14, 1978, 27661 A/78

Int. Cl.³ C04B *11/00, 7/34;* **C01F** *11/46;* **C01G** *41/14*

U.S. Cl. 106—109 **16 Claims**

1. A process for converting into a non-polluting, free-flowing particulate neutralization product the ferrous sulphate heptahydrate obtained as a by-product of the production of titanium dioxide by the sulphate process, which comprises combining a reaction mixture by bringing said ferrous sulphate heptahydrate into contact with calcium hydroxide as a neutralizing agent in an apparatus suitable for mixing powders, in the presence of free water in an amount not exceeding 12% by weight with respect to the reaction mixture using a molar ratio between said neutralizing agent and said ferrous sulphate of at least 1:1, reacting the resulting mixture under agitation at a temperature not exceeding 60° C. and for a mixing time not exceeding five minutes, and discharging the resulting neutralization product from said apparatus, said neutralization product being a free-flowing particulate.

4,292,086

ALL WEATHER WOOD SEALER AND MARKER

Trevor P. Clark, deceased, late of North Vancouver, Calif.X, and by Constance C. Clark, executrix, 3650 Sunnycrest Dr., North Vancouver, B. C., Canada (V7R 3C6)

Continuation-in-part of Ser. No. 859,090, Jan. 10, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,888

Claims priority, application Canada, Mar. 21, 1977, 274427

Int. Cl.³ C08L *1/28, 91/06, 93/00, 93/04*

U.S. Cl. 106—172 **8 Claims**

1. An all-weather wood marking and sealing composition comprising:

(a) 40% to 90% by weight of an alcohol selected from the group consisting of methanol and ethanol;

(b) 0.2% to 4.0% by weight of a water insoluble sealing means dispersed in said alcohol, said sealing means comprising an alkyl ether of cellulose;

(c) 2% to 60% by weight of a water insoluble wood adhesive means dissolved in said alcohol, said wood adhesive means selected from the group consisting of rosin, shellac, benzoin, colophony, copal, damar and vinsol;

(d) 0.1% to 15% by weight of methyl abietate;

(e) 0.5% to 15% by weight hydrophobic silica, said hydrophobic silica having substantially 0.7 millimol of methyl groups chemically bonded to silica per 100 square meters of surface area of said hydrophobic silica;

(f) 0.2% to 30% by weight of a salt of stearic acid, said salt being selected from the group consisting of calcium stearate, aluminum stearate, magnesium stearate, and zinc stearate; and

(g) water insoluble pigment.

4,292,087

COATINGS PIGMENTED WITH NONLEAFING ALUMINUM FLAKE

Harry E. Bell, East Brunswick, N.J., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Feb. 28, 1979, Ser. No. 16,666

Int. Cl.³ C08K *3/08;* **C08L** *1/18, 67/00*

U.S. Cl. 106—193 M **35 Claims**

1. A pigmented coating composition comprising a vehicle comprising a film-forming binder and a substantially nonleafing aluminum flake pigment produced by reducing aluminum to flake in the presence of a milling agent comprising isostearic acid.

4,292,088

BEESWAX SUBSTITUTE

Ingeborg Scheuffgen, Neuss, and Uwe Ploog, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 102,266

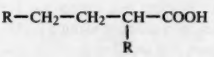
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856277

Int. Cl.³ A61K *7/00, 7/025;* **C08L** *91/06, 91/08*

U.S. Cl. 106—268 **8 Claims**

1. A substitute beeswax composition comprised of:

(a) from about 3 to 15% by weight, based on the weight of the total composition, of α-branched, aliphatic monocarboxylic acids of the general formula



in which R represents a linear alkyl radical with from about 12 to 20 carbon atoms;

(b) from about 15 to 30% by weight of esters of fatty alcohols of chain lengths of C_{12}–C_{22} and fatty acids of chain lengths of C_{14}–C_{22};

(c) from about 5 to 20% by weight of triglycerides of palmitic, stearic, hydroxystearic, or behenic acid;

(d) from about 20 to 40% by weight of mono- and/or diglycerides of palmitic, stearic, hydroxystearic, or behenic acid;

(e) from about 5 to 20% by weight of fatty acids or hydroxy fatty acids of chain lengths C_{16}–C_{22}; and

(f) from 0 to about 30% by weight of microcrystalline paraffins having a melting range of from 70° to 72° C.

8. A cosmetic agent for the care and protection of the skin of warm-blooded animals comprising from 1 to 50% by weight, relative to the total agent, of a beeswax substitute composition of claim **1** and the remainder conventional cosmetic excipients.

4,292,089

PROCESS FOR CONTINUOUSLY DISSOLVING A PARTICULATE SOLID MATERIAL, NOTABLY A LIGNOCELLULOSE MATERIAL

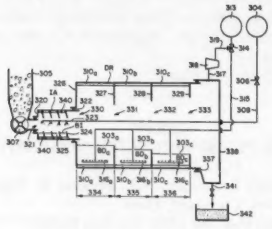
Alain Regnault, Ornex; Jean-Pierre Sachetto, St-Julien-en Genevois; Herve Tournier, Valleiry, all of France; Thomas Hamm, Le Lignon, and Jean-Michel Armanet, Onex, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Filed Oct. 4, 1979, Ser. No. 82,221

Claims priority, application Switzerland, Oct. 4, 1978, 10298/78

Int. Cl.[3] **C13K** *1/02*

U.S. Cl. 127—1 **7 Claims**



6. Apparatus for continuously dissolving in hydrochloric acid the cellulose contained in a fragmented lignocellulose material which leaves fine residual particles in suspension within the acid, characterised in that it comprises:

(a) an impregnating device having an auxiliary rotating horizontal drum provided with a transverse wall defining an inlet end of this drum and having an axial inlet aperture for admitting the fragmented solid material to be impregnated, liquid feed means for the continuous supply to this auxiliary drum of an adjustable quantity of hydrochloric acid for impregnating and dissolving the fragmented material, means for forming at the bottom of this auxiliary drum an impregnating bath and for causing this bath and the solid material to advance along the bottom of the drum, means for effecting cyclical immersion of the fragmented material in this impregnating bath, and an outlet end constituting a free outlet aperture enabling the continuous discharge of the impregnated fragmented material simultaneously with the acid out of this auxiliary drum; and

(b) a main horizontal rotating drum for continuously dissolving the impregnated fragmented material, said main drum having a first transverse wall defining an axial inlet end communicating with the free outlet end of the auxiliary drum, so that the impregnated fragmented material and the acid can pour together continuously into the main drum through its axial inlet aperture, the main drum communicating with the auxiliary drum and with a collector chamber provided at its outlet so as to form together a closed chamber; and wherein

(c) the said horizontal main drum is subdivided into a plurality of communicating chambers defined respectively by the said first transverse annular wall at the inlet of the main drum, by at least one intermediate transverse wall in the main drum, and by a final transverse wall defining an outlet end of the main drum;

(d) the said annular transverse walls have respective axial apertures the diameters of which increase from one wall to the next along the main drum in such a manner as to enable the acid to form in the said chambers a plurality of baths disposed in cascade, the overflow of each bath discharging into the next bath and being discharged by a last overflow out of the main drum at its outlet end;

(e) the said main drum is adapted to impart to the impregnated fragmented material immersed in said baths an adjustable mixing movement making it possible to keep the fragments of this material in intimate contact with the acid in the interior of said baths, to keep in suspension the fine residual particles resulting from the partial dissolution of the fragments, and to discharge the suspended fine particles continuously by the said overflow discharge of the acid; and

(f) the said main drum is associated with a gas feed device allowing the bubbling of an adjustable quantity of hydrogen chloride gas through said baths, in order to dissolve the cellulose under the combined effects of the gas thus caused to bubble through and of the said adjustable mixing movement.

4,292,090

REMOVAL OF TITANIUM DIOXIDE FROM A FILTER ELEMENT

Chris C. Chao, Los Angeles, Calif., assignor to Textron Inc., Providence, R.I.

Filed May 15, 1980, Ser. No. 149,823

Int. Cl.[3] **B08B** *3/08*

U.S. Cl. 134—2 **11 Claims**

1. A method for removing titanium dioxide from contaminated workpieces, comprising:

immersing the workpiece in an aqueous alkaline solution, the solution containing sufficient calcium ions to convert the titanium dioxide to a rinsable product; and

rinsing the workpiece.

4,292,091

METHOD OF PRODUCING SEMICONDUCTOR DEVICES BY SELECTIVE LASER IRRADIATION AND OXIDATION

Ryoiku Togei, Machida, Japan, assignor to VLSI Technology Research Association, Kawasaki, Japan

Filed Feb. 25, 1980, Ser. No. 124,467

Claims priority, application Japan, Feb. 28, 1979, 54-22934

Int. Cl.[3] **H01L** *21/26, 21/263*

U.S. Cl. 148—1.5 **22 Claims**

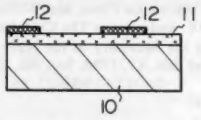
1. A method of producing a desired semiconductor or circuit element comprising the steps of:

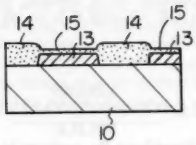
forming an amorphous silicon layer on a substrate;

forming a patterned mask film on said amorphous silicon layer to shield a portion thereof, thereby defining shielded and exposed areas of said amorphous silicon layer;

selectively annealing said amorphous silicon layer with a laser beam to change said amorphous silicon layer into a single-crystalline silicon layer except for said shielded area of said amorphous silicon layer;

removing said patterned mask film;
oxidizing the remaining amorphous silicon layer to change it into a field isolating oxide layer; and





forming the desired semiconductor element or circuit element in said single-crystalline silicon layer.

4,292,092

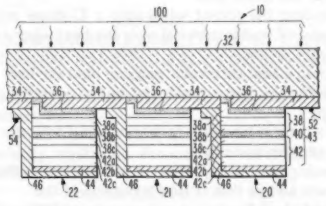
LASER PROCESSING TECHNIQUE FOR FABRICATING SERIES-CONNECTED AND TANDEM JUNCTION SERIES-CONNECTED SOLAR CELLS INTO A SOLAR BATTERY

Joseph J. Hanak, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 2, 1980, Ser. No. 156,081

Int. Cl.[3] H01L *21/263;* **B23P** *23/04;* **B23K** *9/00*

U.S. Cl. 148—1.5 **19 Claims**



1. A method of fabricating a solar battery comprising:
scribing a transparent electrode on a transparent substrate with a laser of sufficient power to form a plurality of transparent electrode strips;
fabricating an active region of a semiconductor material on said substrate and said transparent electrode strips;
scribing said active region with a laser parallel and adjacent to the first scribing so as to scribe through said active region and form strips of active region but not the transparent electrode; and
interconnecting said strips of active region in series with a back electrode.

4,292,093

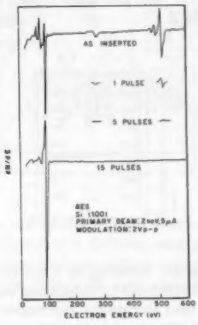
METHOD USING LASER IRRADIATION FOR THE PRODUCTION OF ATOMICALLY CLEAN CRYSTALLINE SILICON AND GERMANIUM SURFACES

Gary W. Ownby, Knoxville; Clark W. White, Oak Ridge, and David M. Zehner, Lenoir City, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1979, Ser. No. 108,199

Int. Cl.[3] H01L *21/265, 21/22*

U.S. Cl. 148—4 **6 Claims**



1. A method for treating a body of crystalline silicon having a surface region which is contaminated with a macro amount of oxygen, to render said region atomically clean with respect to said oxygen, said method comprising:
in an evacuated zone, irradiating said region with a plurality of Q-switched laser pulses characterized by a peak-power density in the range of from about 70 to 190 MW/cm^2.

4,292,094

PROCESS FOR INCREASING THE CORROSION RESISTANCE OF NITRIDED STRUCTURAL PARTS MADE OF IRON MATERIAL

Helmut Kunst, Rodenbach, and Christian Scondo, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 13, 1980, Ser. No. 177,797

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1979, 2934113

Int. Cl.[3] C23F *7/04*

U.S. Cl. 148—6.11 **3 Claims**

1. In a process for the treatment of nitrided structural parts of iron work pieces by an oxidation treatment subsequent to the nitriding process, the improvement comprising increasing the corrosion resistance of the nitrided parts by treating at a temperature of 250° to 450° C. in an oxidizing salt bath consisting of an alkali hydroxide with 2 to 20% of alkali nitrate for 25 to 50 minutes.

4,292,095

PROCESS FOR HYDROPHILIZATION OF METAL SURFACES AND/OR METAL OXIDE SURFACES

Hans-Juergen Schlinsog, Cremlingen, Fed. Rep. of Germany, assignor to The Continental Group, Inc., Stamford, Conn.

Filed Sep. 20, 1979, Ser. No. 77,437

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855170

Int. Cl.[3] C23F *7/00, 7/06*

U.S. Cl. 148—6.14 R **11 Claims**

1. A process for forming a hollow metal article from a metal sheet which comprises the steps of sequentially effecting in the absence of any intermediate step hydrophilization of metal surfaces and/or metal oxide surfaces of the sheet by generating at least one hydroxide of the metal involved on such surfaces,

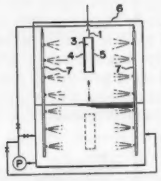
the hydroxide being of the lowest valence stage of the metal and then forming the hydrophilized sheet into the hollow article.

4,292,096

PHOSPHATING PROCESS OF METAL SURFACE

Ryoichi Murakami; Hideo Shimizu; Takashi Yoshii; Minoru Ishida, and Hiroto Yonekura, all of Ikedanakamachi, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Feb. 13, 1980, Ser. No. 121,168
Claims priority, application Japan, Feb. 13, 1979, 54-15839
Int. Cl.[3] C23F *7/08*
U.S. Cl. 148—6.15 Z **3 Claims**



1. In a process for forming an electrocoated film on the surface of a metal substrate by subjecting said metal surface to phosphating and then to cationic electrocoating, the improvement wherein the phosphating consists essentially of first dipping the metal surface into an acidic phosphating solution consisting essentially of a zinc compound in a concentration of 0.5 to 1.5 g/l as a zinc ion, a phosphate in a concentration of 5 to 30 g/l as a phosphate ion and a nitrite in a concentration of 0.01 to 0.2 g/l as a nitrite ion and/or an aromatic nitro compound in a concentration of 0.05 to 2 g/l in water and a chlorate in a concentration of 0.05 to 2 g/l as a chlorate ion, at a temperature of 40° to 70° C. for not less than 15 seconds and then spraying the metal surface with said acidic phosphate solution for not less than 2 seconds.

4,292,097

HIGH TENSILE STRENGTH STEEL SHEETS HAVING HIGH PRESS-FORMABILITY AND A PROCESS FOR PRODUCING THE SAME

Yoshio Nakazato; Tomoo Tanaka; Koichi Hashiguchi, and Naohiko Soeda, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 20, 1979, Ser. No. 68,018
Claims priority, application Japan, Aug. 22, 1978, 53-102054
Int. Cl.[3] C21D *8/04, 7/04*
U.S. Cl. 148—12 C **4 Claims**

1. A process for producing high tensile strength steel sheets with the surface roughness being given at the cold rolling, having excellent shape-fixability and a proportional limit stress less than 20 kg/mm^2, in which the microstructure consists of ferrite grains dispersed with fine martensite islands, the volume fraction of martensite being in a range of 3–10%, which comprises cold rolling a hot rolled steel sheet containing 0.005–0.15% of carbon, and manganese, if necessary boron, molybdenum, chromium, silicon, nickel and copper within a range of 0.27–3% of Mneq. shown by the following formula (1)

$$\text{Mneq.} = \text{Mn} + 124\text{B} + 3\text{Mo} + 3/2\text{Cr} + \tfrac{1}{4}\text{Si} + \tfrac{1}{4}\text{Ni} + \tfrac{1}{4}\text{Cu} \quad (1)$$

so as to obtain the cold rolled steel sheet having such a surface property, that an average surface roughness Ha is 0.4–1.8 μm, PPI value is more than 80 at 0.5 μm cut off level and then heating the cold rolled steel sheet to intercritical temperature between A_1 and A_3, after which cooling the heated steel sheet so that a cooling rate, CR°C./sec, satisfies the following formula (2) in the relation to the above-described Mneq.

$$2.5 \geqq \log \text{CR} \geqq -1.11\text{Mneq.} + 2.8 \quad (2).$$

4,292,098

LIQUID PROPELLANT

Joseph E. Mastroianni, La Plata, and William F. Newton, Clinton, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 17, 1980, Ser. No. 160,350
Int. Cl.[3] C06B *25/36*
U.S. Cl. 149—89 **6 Claims**

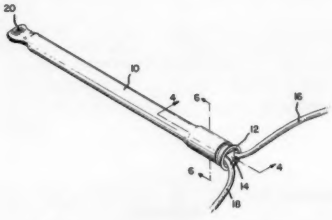
1. In a liquid monopropellant composition comprising a nitrate ester or a nitroparaffin, the improvement which comprises the inclusion from about 5 to about 25 weight percent of the total composition of a di-ester having the formula $\text{ROOC}(\text{CH}_2)_n\text{COOR}$ wherein R is an alkyl of 3 to 5 carbon atoms and n is 5 to 7.

4,292,099

METHOD FOR ENVIRONMENTALLY SEALING A WIRE SPLICE

Leon J. Dinger, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 19,380, Mar. 12, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 157,620
Int. Cl.[3] B21F *15/02;* H01R *43/00*
U.S. Cl. 156—49 **1 Claim**



1. A method of environmentally sealing a wire splice, comprising the steps of:

a. removing insulation from the ends of the two wires to be spliced together;
b. sliding a heat-shrinkable sleeve onto one of said two wires;
c. splicing the two wires together;
d. sliding the heat-shrinkable sleeve to and shrinking it down over the splice area;
e. bending the joined wires into a U-shape and sliding a sleeve of fusible material over the bent wires and past the shrunk sleeve;
f. sliding a heat-shrinkable end cap onto the bent wires with the fusible sleeve positioned in the open end of the end cap;
g. inserting a block of fusible material into the sleeve between the wires; and
h. heating the end cap adjacent its open end so that it shrinks down and so that at least a portion of the

sleeve and block fuse into a unitary mass with the wires embedded therein and with the end cap being bonded thereto.

4,292,100

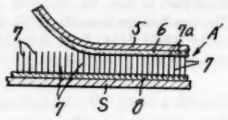
METHOD FOR PREPARING FLOCK TRANSFER INCLUDING DRYING RELEASE ADHESIVE PRIOR TO APPLYING FLOCK

Shigehiko Higashiguchi, 3 -4- 2 Honjo, Sumida-Ku, Tokyo, Japan

Filed Aug. 9, 1979, Ser. No. 65,187
Int. Cl.[3] B44C *3/02*
U.S. Cl. 156—72 **3 Claims**

1. A method for preparing a releasably flocked fiber base for

a transferable flocked fiber design or sticker material comprising the steps of: applying a release adhesive in a liquid state to one major surface of a release support base sheet to form a release adhesive layer, said release adhesive being capable of retaining a viscous state for a predetermined period of time even after the application and drying of the adhesive, drying



said release adhesive with the application of heat to obtain a still viscous adhesive layer, and releasably flocking a plurality of fibers at one of the ends thereof to said still-viscous adhesive layer of the base sheet in substantially upright position by electrostatic flocking means so as to embed said ends of the fibers in said still-viscous adhesive layer in a shallow depth.

4,292,101

METHOD OF FABRICATING COMPOSITE MEMBERS

James B. Reichert, 564 Midvale, Apt. 7, Los Angeles, Calif. 90024

Continuation of Ser. No. 16,965, Mar. 5, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 193,939

Int. Cl.³ B29D *27/00*

U.S. Cl. 156—156 **17 Claims**

1. A method for the fabrication of high density precision walled composite members laminated of resin impregnated fibers, and including;

the first step of preparing a mold with the contour of the part to be produced,

the second step of preforming a depressible core of cured noninterconnected cellular material containing bodies of expansible fluid therein and of the same shape as and to have a contour exactly complementary to and opposing the contour of the mold,

the third step of laying up a resin impregnated skin between the mold and the core,

the fourth step of backing up the core contour with respect to its opposition to the mold contour and depressing the core for compression of the skin,

and the fifth step of applying heat to the core and skin to expand the fluid bodies contained in the core and cause pressure of the core against the skin and curing the same between the contours of the mold and core respectively.

4,292,102

PROCESS AND MACHINE FOR COVERING A TUBULAR MEMBER, MORE PARTICULARLY FOR COVERING A BOX

Georgy Bidegain, Serres Castet, France, assignor to Embadac S.A., Morlaas, France

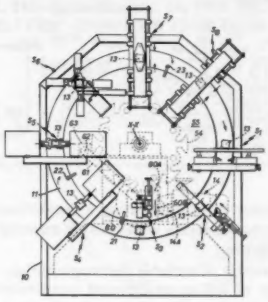
Filed Nov. 13, 1979, Ser. No. 93,600

Claims priority, application France, Nov. 10, 1978, 78 31856; May 23, 1979, 79 13077

Int. Cl.³ B29C *17/04*

U.S. Cl. 156—213 **30 Claims**

1. A machine for covering a tubular member with sheets, comprising a fixed frame, a plate mounted so as to be rotatable on the frame about a general axis, the frame having a plurality of fixed stations for the winding of an adhesive covering strip portion around the tubular member and for inserting a projection of the strip portion into an open end of the tubular member, the rotating plate having a plurality of spindles parallel to the general axis, each spindle having a mandrel of the same cross section as the tubular member mounted integrally therewith, and, mounted so as to be angularly fixed and freely movable in translation, a cap of the same cross section as the mandrel, means for controlling the rotation of the plate in order to bring the spindles successively up to the stations, means for winding the strip portion about the tubular member engaged on the mandrel, means for moving the cap in translation relative to the mandrel between a distant position and a near position in order to insert the projection of the strip por-



tion into the open end of the tubular member, and a spindle integral with the frame and defining said general axis, said spindle having an overhanging portion supporting, at its free end, a fixed platen on which the various working stations are mounted.

4,292,103

TRANSFER PRINTING

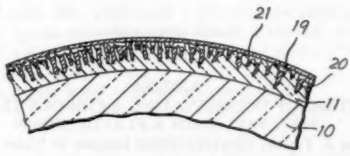
Shigekazu Namura, and Takao Sumi, both of Kyoto, Japan, assignors to Nissha Printing Co., Ltd., Japan

Filed Feb. 6, 1980, Ser. No. 119,029

Claims priority, application Japan, Feb. 13, 1979, 54/15918

Int. Cl.³ B41M *3/12;* **B44C** *1/16;* **B41M** *5/26*

U.S. Cl. 156—230 **16 Claims**



1. A method of coloring the surface of an object of heat-resistant material, comprising the steps of:

applying colloidal alumina, colloidal silica or a mixture thereof to the surface of said object;

drying said applied alumina, silica or mixture thereof;

sintering said alumina, silica or mixture thereof at 350° C. to 800° C. for 15 minutes to 180 minutes to form an adsorptive porous layer of activated alumina, silica or mixture thereof on the surface of said object;

applying to said adsorptive porous layer a transfer material including a carrier sheet and a design layer formed on said carrier sheet releasably therefrom and containing heat-diffusible colorants;

stripping said carrier sheet away from the remainder of said transfer material so as to leave at least said design layer adhered to said adsorptive porous layer of said object;

heating said design layer at 100° C. to 250° C. for 1 minute to 60 minutes so as to cause said colorants in said design layer to migrate into said adsorptive porous layer to be fixed therein; and

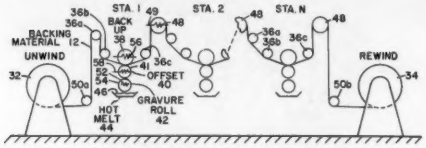
removing the remnants of said transfer material from said porous layer.

4,292,104

DECALCOMANIA MANUFACTURE

Kim P. Heimbach, Corning, N.Y., and Ronald E. Johnson, Tioga, Pa., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 13, 1979, Ser. No. 74,910
Int. Cl.³ B05C *1/00*; B41F *9/00*; B41M *3/12*
U.S. Cl. 156—235 **13 Claims**



1. In a process for manufacturing a decalcomania or decal formed of successive layers with backing material and design, the steps comprising:

selecting a supply of meltable thermoplastic ink, maintaining the suppy of ink at an elevated temperature above its melting point, depositing the supply of melted thermoplastic ink on a gravure surface to establish a portion of the design, maintaining said gravure surface at an elevated temperature above the melting point of the ink, rollably engaging the gravure surface in tangential contact with a relatively easily releasable offset surface, transferring the portion of the design from the former to the latter, rollably engaging the offset surface in tangential contact with the backing material for transferring the portion of the design from the former to the latter, maintaining the temperature of the offset surface to a level at which the ink carried thereon becomes at least partially solidified into a cohesive film having affinity for the offset surface in preference to the gravure surface, and, at said temperature maintained at said offset surface, it exhibits at least sufficient adherence for preferentially sticking the ink to the backing material as a cohesive film during the step of contacting the offset surface with the backing material.

4,292,105

METHOD OF IMPREGNATING A FIBROUS TEXTILE MATERIAL WITH A PLASTIC RESIN

Gordon J. Taylor, Hinckley, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,012
Int. Cl.³ B29B *25/00*
U.S. Cl. 156—242 **17 Claims**

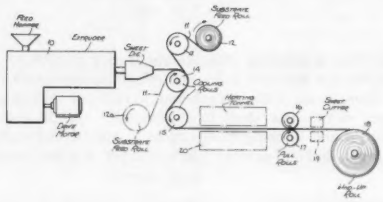
1. A method of impregnating a fibrous textile material with a plastic resin which comprises forming a dispersion of a powdered plastic resin in water; adding to the dispersion a water-soluble thickener selected from the group consisting of polyethylene oxide, ethyl methyl cellulose, hydroxyethyl cellulose, hydroxyethyl methyl cellulose, hydroxypropyl methyl cellulose, methyl cellulose, polyacrylamid, polyvinyl alcohol, polyvinyl methyl ether, starch, agar-agar, casein and gelatin, in an amount sufficient to impart to the dispersion a viscosity of at least about 300 centipoises to 5000 centipoises at 25° C.; applying the dispersion to a fibrous textile material to distribute the resin over the fibers thereof; maintaining the dispersion in contact with the fibrous textile material for a period of time sufficient to allow the fibrous textile material to absorb an amount of the dispersion sufficient to provide from about 0.15 gram of resin per gram of fiber to about 4.0 grams of resin per gram of fiber after drying; drying the fibrous textile material treated in this manner to remove the water present; and heating the dried material at a temperature sufficiently elevated to cause the resin to fuse and form a matrix for the fibers.

4,292,106

PROCESS OF PRODUCING REINFORCED LAMINATES FROM CROSSLINKABLE THERMOPLASTIC OLEFIN POLYMER MATERIAL

C. George Herschdorfer, Port Chester, N.Y., and Dennis J. Vaughan, Anderson, S.C., assignors to Clark-Schwebel Fiber Glass Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 923,654, Jul. 11, 1978, abandoned. This application Jun. 25, 1979, Ser. No. 51,837
Int. Cl.³ B29D *7/14, 7/16, 9/04, 23/04*
U.S. Cl. 156—243 **57 Claims**



1. A process of producing reinforced laminates from crosslinkable thermoplastic olefin polymer material, comprising the steps of

heating a normally solid, high molecular weight crosslinkable thermoplastic olefin polymer selected from the group consisting of ethylene homopolymers, copolymers of ethylene and at least one acyclic mono-1 olefin hydrocarbon having 2 to 8 carbon atoms per molecule, and mixtures thereof, having a melt index of at least about 10, and a density in the range of 0.910 to 0.970 and containing an acetylenic diperoxy catalyst which reacts with and effects crosslinking of said polymer and which has a decomposition temperature between about 310° F. and about 525° F., to a molten state at a melting temperature between about 270° F. and 300° F.,

forming a continuous non-reinforced sheet from said molten polymer at a temperature below said decomposition temperature,

cooling said continuous sheet to a temperature below said melting temperature to a self-supporting, two-dimensional molecular state,

combining said sheet in said self-supporting state with a glass fibrous substrate treated with an unsaturated organosilanol coupling agent which reacts with said polymer and said glass fibrous substrate and effects bonding of said polymer to said substrate to form a laminate,

heating said laminate under pressure to a temperature between about 310° F. and about 525° F. to react said catalyst with said polymer and effect at least 80% crosslinking of said polymer to a three-dimensional molecular state, and

cooling said laminate to a temperature below said melting temperature to a self-supporting state.

4,292,107

PROCESS FOR MANUFACTURING A RADIOGRAPHIC INTENSIFYING SCREEN

Michio Tanaka, Fujisawa; Norio Miura, Isehara, and Keiji Shimiya, Hiratsuka, all of Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Feb. 6, 1979, Ser. No. 9,842
Claims priority, application Japan, Feb. 10, 1978, 53-14305
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—249 **42 Claims**

1. A process for manufacturing a radiographic intensifying screen comprising steps of

applying to a surface of a support a dispersion comprising (a) an ultraviolet radiation-curable resin composition which is composed of an unsaturated resin, a polymerizable mono-

mer and a sensitizer, and (b) a radioluminescent phosphor dispersed in said composition (a) to form a coating on said support,

removing from said coating, ingredients, if present, other than composition (a) or phosphor (b) so that the coating consists essentially of composition (a) and phosphor (b); and then

curing the coating by exposing said coating to ultraviolet radiation to form a fluorescent layer on said support.

29. A process for manufacturing a radiographic intensifying screen comprising steps of

applying to a surface of a flat plate a dispersion comprising (a) an ultraviolet radiation-curable resin composition which is composed of an unsaturated resin, a polymerizable monomer and a sensitizer, and (b) a radioluminescent phosphor dispersed in said composition (a) to form a coating on said flat plate,

removing from said coating, ingredients, if present, other than composition (a) or phosphor (b) so that the coating consists essentially of composition (a) and phosphor (b); and then

curing said coating by exposing said coating to ultraviolet radiation to form a fluorescent layer on said flat plate,

peeling off said fluorescent layer from said flat plate, and

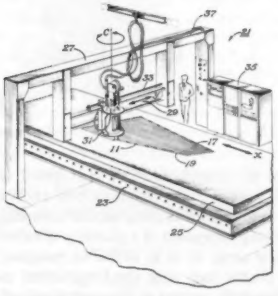
bonding said fluorescent layer to a surface of a support.

4,292,108

COMPOSITE TAPE LAYING APPARATUS INCLUDING MEANS FOR PLURAL LONGITUDINAL AND TRANSVERSE CUTS

Olin E. Weiss, Anneta North; Grant L. Davis, Fort Worth; James L. Hudson, Azle, and Harlan T. Dowell, Fort Worth, all of Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed Dec. 10, 1979, Ser. No. 101,524
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—259 **11 Claims**



1. An improved method for laying composite tape to form a structural member, the method comprising the steps of:

conveying the tape from a tape supply toward a work surface;

slitting the tape lengthwise to form a plurality of slits;

cutting the tape transversely by a plurality of transverse cutter to form a plurality of transverse cuts with selected slits and cuts intersecting in a predetermined pattern to sever the tape from the tape supply; and

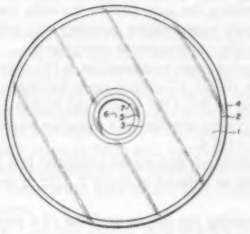
pressing the severed tape onto the work surface.

4,292,109

METHOD OF MAKING LASER DISC MEMORY STORAGE ARTICLE

Carl H. Becker, 521 Del Medio Ave., Apt. 116, Mountain View, Calif. 94040

Continuation-in-part of Ser. No. 931,515, Aug. 7, 1978, abandoned. This application Sep. 14, 1979, Ser. No. 75,707
Int. Cl.³ C03C *17/09;* **B32B** *15/08;* **G01D** *15/34*
U.S. Cl. 156—281 **2 Claims**



1. The method of making a flexible disc for laser disc mass storage and retrieval of data comprising the steps of

establishing a first disc layer of saturated polyester plastic in a vacuum chamber

rotating said first disc layer,

vacuum depositing a thin metal film on said rotating first disc layer, and

covering said thin metal film within the vacuum chamber with saturated polyester plastic thereby vacuum encapsulating the metal thin film and establishing an optically perfect interface between the saturated polyester plastic and thin metal film.

2. The method of making a flexible disc for laser disc mass storage and retrieval of data comprising the steps of

establishing a glass disc in a vacuum chamber, vacuum depositing thin metal films on the opposed broad surfaces of said glass disc, positioning a saturated polyester plastic disc against each thin metal film in a vacuum chamber with a layer of liquid saturated polyester plastic of precise thickness there between,

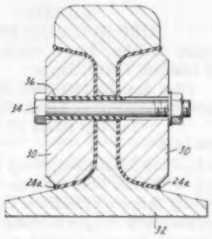
hardening the liquid saturated polyester plastic.

4,292,110

FABRIC-REINFORCED BONDING SHEET COMPRISING AN EPOXY RESIN AND DIANILINE AND USE THEREOF TO MAKE AN INSULATED RAIL JOINT

Bruce A. Marteness, Inver Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul., Minn.

Filed Jul. 23, 1979, Ser. No. 59,617
Int. Cl.³ B32B *3/26, 17/04, 27/26, 27/38*
U.S. Cl. 156—92 **13 Claims**



1. A pre-form which fits the facing surfaces of the joint bar and rails of a rail joint and comprises at least one layer of a

fabric-reinforced bonding sheet comprising at least one layer of a reinforcing fabric saturated with a resin composition comprising an intimate blend of (a) 1,2-epoxy resin having a Durrans' softening point of 50°–110° C. and (b) within 15% by weight of an equivalent amount of a dianiline having a melting point of 50°–110° C., which bonding sheet can be stored for months at ordinary room temperatures but its resin composition fully cures at any time to a strong, tough thermoset state when heated to about 140° C. for about 25 minutes.

7. A rail joint comprising a pair of rails, a pair of joint bars, means bolting the joint bars to the rails, and a fabric-reinforced cured resin composition bonding the joint bars to the rails, wherein the improvement comprises:

said cured resin composition is the cured product of a mixture of (a) 1,2-epoxy resin having a Durrans' softening point of 50°–110° C. and (b) within 15% by weight of an equivalent amount of a dianiline having a melting point of 50°–110° C.

8. Method of making an insulated rail joint using a pair of pre-forms as defined in claim 1, which method comprises the steps of:

(a) cleaning the facing surfaces of a pair of joint bars and a pair of rails which have been formed to receive bolts,

(b) heating the rails and joint bars so that the temperature of their facing surfaces is about 50°–80° C. higher than the higher of the softening point of the epoxy resin and the melting point of the dianiline,

(c) assembling the rails and joint bars with one of said preforms between each set of facing surfaces, and

(d) inserting bolts with insulated bushings and tightening the bolts before the resin composition of the bonding sheet begins to gel.

4,292,111

METHOD OF ADHESION OF RUBBER TO REINFORCING MATERIALS

Rao S. Bezwada, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 8,204, Jan. 31, 1979, Pat. No. 4,228,045. This application Mar. 3, 1980, Ser. No. 126,264

Int. Cl.³ C09J *5/06;* B05D *3/02*

U.S. Cl. 156—307.7 **19 Claims**

1. A method for forming a strong adhesive bond between a vulcanized natural or synthetic rubber composition and a textile fiber or metal wire embedded therein which comprises embedding a textile fiber or metal reinforcing material in a vulcanizable rubber composition consisting essentially of (A) natural or synthetic rubber, or a mixture thereof; (B) a vulcanizing agent; and (C) from about 1 to 10 parts by weight, per hundred parts by weight of rubber, of (a) glyoxal, (b) a reaction product of glyoxl and from 0.1 to 10 molar proportions of urea or (c) a reaction product of glyoxal, 0.1 to 10 molar proportions of urea and from 0.01 to 2 molar proportions of formaldehyde per molar proportion of glyoxal and vulcanizing said composition.

4,292,112

TIRE BUILDING DRUM

Yuzo Kumagai, Kodaira, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jan. 29, 1980, Ser. No. 116,662

Claims priority, application Japan, Feb. 1, 1979, 54/011069

Int. Cl.³ B29H *17/16*

U.S. Cl. 156—415 **2 Claims**

1. A tire building drum, comprising in combination:

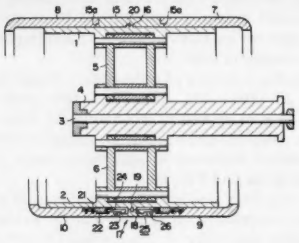
a plurality of arcuate base segments radially expansible to collectively define a cylindrical shape;

a pair of arcuate side flanges mounted on each of said arcuate base segments in opposing and spaced relation with each other to be axially slidable toward and away from each other;

an arcuate spacer section mounted on each of said arcuate base segments between said arcuate side flanges to form a cylindrical outer surface and a certain drum width of the tire building drum;

a positioning pin secured to said arcuate base segments for positioning said spacer section on said arcuate base segments;

a hook engaging said arcuate said flanges and said arcuate spacer section;



a spring resiliently urging said hook to engage said arcuate side flanges and said arcuate spacer section; and

a hook removing pin insertable into the tire building drum so as to disengage said arcuate side flanges from said arcuate spacer section.

4,292,113

METHOD AND APPARATUS FOR MANUFACTURING CORRUGATED TUBES

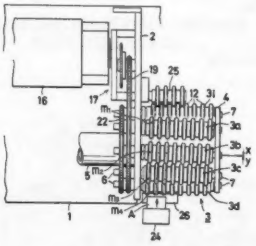
Mituto Hirata, Kamakura, Japan, assignor to Toyo Kagaku Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 20,393, Mar. 14, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 157,702

Claims priority, application Japan, Mar. 14, 1978, 53-28326

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—428 **6 Claims**



1. Apparatus for manufacturing a corrugated tube having axially extending spiral convolutions to form a corrugated wall configuration in longitudinal cross-section comprising:

a roller assembly composed of a plurality of rollers arranged in a circular array so as to define an imaginary cylinder about its central axis with the longitudinal axes of said rollers offset with respect to the central axis of the imaginary cylinder while the rollers are maintained in parallel to each other, each of said rollers comprising a roll mandrel and a plurality of rings fitted around the mandrel, said rings defining a plurality of axially equally spaced annular ridges around each of said rollers, the ridges of the respective rollers being arranged such that the associated ridges of each adjacent roller are successively aligned with each other along a spiral path, said rings being adjustably fastened to the mandrel by screws so as to permit adjustment of the pitch of the rings along the mandrel as required;

means for continuously feeding a flat strip of synthetic resin

material in a softened state transversely onto the periphery of said roller assembly;

drive means for rotating each of said rollers at the same speed;

cooling means for introducing cooling medium into each of said rollers and discharge means for discharging the cooling medium therefrom; and

pressure roller means having annular ridges therearound adapted to mate with recesses defined by each adjacent ridge of at least one of said rollers

whereby said strip is spirally wrapped around the roller assembly while being axially advanced as the strip is fed onto the periphery of the roller assembly and the strip is formed with corrugations along said ridges as it is wrapped around.

4,292,114

APPARATUS FOR COILING WIRE

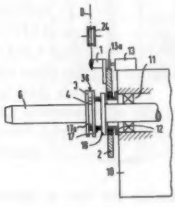
Gunther Engmann; Werner Lepach, both of Schwabach, and Heinz Speyerer, Nuremberg, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Niehoff KG, Schwabach, Fed. Rep. of Germany

Filed Aug. 2, 1979, Ser. No. 62,945

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2833955

Int. Cl.[3] **B65H** *54/00, 67/04*

U.S. Cl. 156—447 **13 Claims**



1. In a single spooler for winding wire on a flanged spool having one rotatable spindle for mounting said spool and means for traversingly feeding the wire thereto, apparatus for automatically carrying the lead end of the wire to the spool and casting the wire over the flange, comprising support means mounted to orbit about said spindle, said support means having mounted thereon a clamping head operable to fixedly secure said wire thereto, and a guide member offset in the orbital path from said clamping wire for causing the wire to shift laterally, and clasping means mounted adjacent said spindle to hold said wire, said clamping head being operable on movement of said support means to lead said secured wire from said feed means into proximity with said spindle adjacent said spool whereupon said clasping means is operable to secure the same, and on further movement of said support means the guide member is operable to cast the wire over the flange of said spool onto the core thereof.

4,292,115

CARTRIDGE FILM UNLOADING AND SPLICING SYSTEM

Herman L. Jones, Marysville, and Richard F. Kent, Snohomish, both of Wash., assignors to J & H Manufacturing, Inc., Marysville, Wash.

Continuation of Ser. No. 945,251, Sep. 25, 1978, abandoned, which is a continuation of Ser. No. 676,062, Apr. 12, 1976, abandoned. This application Aug. 9, 1979, Ser. No. 65,230

Int. Cl.[3] **B65H** *21/00;* **G03B** *1/20*

U.S. Cl. 156—502 **10 Claims**

1. Apparatus for use in successively withdrawing film strips from a plurality of film cartridges, wherein each film strip is respectively interwound with a backing strip positioned inside the corresponding film cartridge, said apparatus comprising:

(a) magazine means for storing the plurality of film cartridges, said magazine means including a cartridge passageway in which the plurality of film cartridges may be succesively placed on edge to form a cartridge stack;

(b) cartridge dispensing means for successively dispensing film cartridges from said magazine means, said cartridge dispensing means including

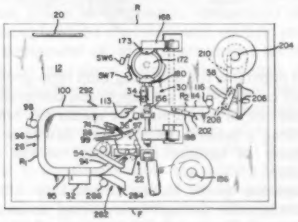
(1) a receptacle structure which receives said magazine means,

(2) a rocker arm pivotally supported within said receptacle structure and movable between first and second positions, said rocker arm having secured thereto a first pin element which blocks said cartridge passageway in said magazine means to hold the lowest film cartridge of said cartridge stack in place when said rocker arm is moved to said first position and which retracts from said cartridge passageway to permit the dispensing of the lowest film cartridge of said cartridge stack when said rocker arm is moved to said second position,

(3) biasing means to bias said rocker arm toward said first position, and

(4) probe means for engaging said rocker arm and for periodically moving said rocker arm to said second position against the bias exerted by said biasing means; and

(c) film extraction means for receiving film cartridges dispensed by said cartridge dispensing means and for withdrawing and separating the interwound film and backing strips positioned inside the film cartridges so received, said film extraction means including



(1) stripper means for intervening between the backing strip and the film strip of a received film cartridge, and

(2) finger means operating in alternating sequence with said probe means of said cartridge dispensing means to engage the backing strip in the received film cartridge when said rocker arm of said cartridge dispensing means is in said first position and to force the withdrawal of the backing strip and film strip conjointly from the received film cartridge past said stripper means such that the backing strip separates and moves away from the film strip.

3. Apparatus as set forth in claim **1**, wherein said film extraction means additionally includes a first roller means for receiving and exerting a tensile force on the backing strip at a point after the backing strip is separated from the film strip such that both the backing strip and the film strip are entirely withdrawn from the received film cartridge.

4. Apparatus as set forth in claim **3**, including means for transporting the film strip away from said film extraction means while said first roller means is separately removing the backing strip from the film cartridge, said means for transporting the film strip having a second roller means for engaging and curving the film strip thereabout at a point before said stripping means intervenes between the backing strip and the film strip.

5. Apparatus as set forth in claim **4** additionally including a cutter means for cutting the leading and trailing edges of the film strip withdrawn from the received film cartridge and a splicer means for splicing the trailing edge of the film strip so

cut to the leading edge of a film strip subsequently withdrawn from a succeeding film cartridge.

10. Apparatus as set forth in claim **1**, wherein said finger means also includes a detent means for engaging the received film cartridge when said finger means engages the backing strip positioned therein and for discharging the received film cartridge from said film extraction means when said finger means moves out of engagement with the backing strip.

4,292,116

APPARATUS FOR MOUNTING CHIP TYPE CIRCUIT ELEMENTS ON A PRINTED CIRCUIT BOARD

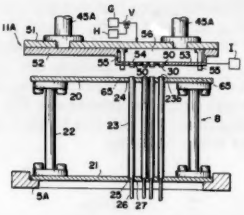
Tetsuo Takahashi; Yoshinobu Taguchi; Shuichi Tando, and Kenichi Saito, all of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Apr. 10, 1979, Ser. No. 28,924

Claims priority, application Japan, Apr. 18, 1978, 53/50219[U]; Apr. 18, 1978, 53/50220[U]; Apr. 25, 1978, 53/54816[U]; Apr. 25, 1978, 53/54817[U]; Aug. 30, 1978, 53/118748[U]; Nov. 22, 1978, 53/160112[U]

Int. Cl.[3] **B65G** *59/04;* **B65H** *3/44;* **H01L** *21/98*

U.S. Cl. 156—566 **15 Claims**



1. An apparatus for mounting chip type circuit elements on a printed circuit board, said apparatus comprising

printed circuit board support means for horizontally supporting a printed circuit board having a predetermined pattern of laminar conductors on the upper surface thereof;

a magazine guide having a plurality of through-holes therein, said through-holes being located at positions corresponding to relative positions of circuit elements to be mounted on said printed circuit board;

a plurality of hollow tubular magazines fitted in said through-holes in said magazine guide, and having top openings substantially in a common horizontal plane, each of said tubular magazines having a hollow interior adapted to hold a stack of a plurality of chip type circuit elements;

circuit element push means adjacent said magazine for incrementally pushing each circuit element stack in said tubular magazines upwardly to a position where the top circuit element in each circuit element stack is positioned at said top opening of each tubular magazine;

circuit element suction means including a flat suction plate having a plurality of suction holes at positions corresponding to relative positions of said tubular magazines fitted in said through-holes of said magazine guide for suctioning each said top circuit element positioned at said top opening in each circuit element stack of each tubular magazine and for mounting each circuit element suctioned on said flat suction plate on said printed circuit broad; and

transfer means for (a) moving said flat suction plate between said suction position and an intermediate position where each respective circuit element suctioned on said flat suction plate overlies in precise vertical alignment a corresponding respective position on the upper surface of the printed circuit board at which said circuit element is to be mounted and (b) vertically moving at least one of said suction plate and printed circuit board until said circuit elements, still suctioned in said suction plate, are brought into contact with the printed circuit board, said transfer means including a suction plate supporting head supporting the flat suction plate for movement, and means for releasing said circuit elements from said suction plate after said circuit elements are brought into contact with the printed circuit board, so that each said circuit element is suctioned on said flat suction plate and mounted precisely under a uniform pressure on said upper surface of said printed circuit board.

4,292,117

GLUE ROLLER IN A LABELING MACHINE

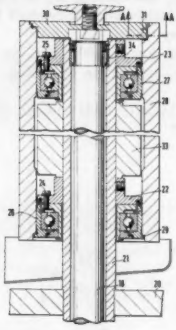
Rudolf Zodrow, Dusseldorf, and Egon Höveler, Haan, both of Fed. Rep. of Germany, assignors to Jagenberg Werke AG, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,714

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 2826618

Int. Cl.[3] **B05C** *1/08;* **B65C** *9/16*

U.S. Cl. 156—578 **4 Claims**



1. In a glue roller assembly for use in labeling machine having glue segments, the assembly having a stationary machine frame, a roller drive shaft mounted rotatably in the machine frame coupled with a machine drive by a transmission and a glue roller barrel which is adjustable relative to the glue segments of the labeling machine, the improvement comprising means mounting the glue roller barrel to permit radial adjustment thereof relative to the drive shaft comprising a stationary hollow shaft disposed substantially concentrically around the drive shaft and fixed to the machine frame, axially offset bearing means disposed between the barrel and the hollow shaft to permit the radial adjustment of the glue roller barrel with respect to the hollow shaft and means for coupling the drive shaft and the glue roller barrel to prevent relative movement in the circumferential direction while permitting radial adjustment.

4,292,118

IMPULSE HEAT GENERATION AND SEALER APPARATUS

Ihor Wyslotsky, 18630 Golfview La., Hazel Crest, Ill. 60429

Filed May 8, 1980, Ser. No. 147,554

Int. Cl.[3] **B30B** *15/34*

U.S. Cl. 156—583.2 **32 Claims**

1. An improved impulse heat generation and sealer apparatus, said apparatus comprising:

an electrically conductive heat sink block having thereon a smooth face surface;

a relatively shallow groove formed in said face surface;

an electrical insulator/heat conductor film lining of said shallow groove;

a groove filler material of substantial electrical conductivity, substantial thermal shock resistance, substantial ability to expand and contract rapidly without damage, and substan-

tial resistance to abrasion, said groove filler material disposed within and filling said shallow groove and having an outer surface which is smoothly co-extensive with said smooth face surface of said heat sink block;

a thin layer of substantially uniform thickness of release coating material disposed on said smooth outer surface of said heat sink block and across said smoothly co-extensive outer surface of said groove filler material, said release coating layer having a substantially smooth outer surface; and

electrical connector means attached to said groove filler material to provide electrical current thereto for the rapid generation of heat in said groove filler material.

4,292,119

GROWTH OF SINGLE-CRYSTAL $2PBO.FE_2O_3$

Howard L. Glass, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 15, 1980, Ser. No. 168,928

Int. Cl.³ C30B *19/04*

U.S. Cl. 156—624 **5 Claims**

1. A fluxed melt for growing single-crystal $2PbO.Fe_2O_3$, comprising:

boron oxide (B_2O_3);

lead oxide (PbO); and

iron oxide (Fe_2O_3);

wherein the mole ratio of boron oxide to lead oxide in said melt is at least about 0.06;

wherein the concentration of iron oxide in said melt is at least about 9.8 mole percent and not more than about 14.8 mole percent.

4,292,120

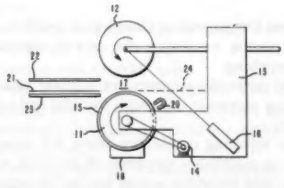
PROCESS OF FORMING A MAGNETIC TONER RESIST USING A TRANSFER FILM

George R. Nacci, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 10, 1980, Ser. No. 139,110

Int. Cl.³ C23F *1/02*; B05D *1/04*; G03G *15/00*

U.S. Cl. 156—660 **9 Claims**



1. A process comprising forming a magnetically held image of coalescible magnetic toner particles, bringing this image into contact with the water soluble polymer coated surface of a heated transfer member comprising a sheet coated with water soluble polymer under pressure to transfer said image to the surface of the transfer member, transferring the image under heat and pressure to a substrate surface to form a resist image thereon corresponding to the magnetically held image, cooling the substrate and stripping away the sheet portion of the transfer member, washing the water soluble polymer off the substrate surface.

4,292,121

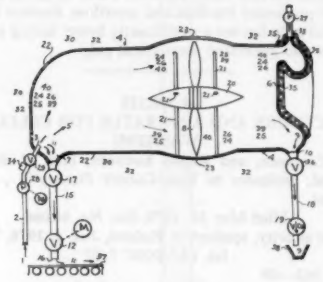
SOLID/LIQUID SEPARATION THROUGH LIQUID VAPORIZATION AND CONDENSATION, AND APPARATUS THEREFOR

Peter J. Caffes, Silver Spring, Md., assignor to The Caffes Trust, Washington, D.C.

Filed Sep. 21, 1979, Ser. No. 77,555

Int. Cl.³ B01D *1/16*

U.S. Cl. 159—3 **39 Claims**



1. A substantially-closed horizontally-disposed hollow module having a single chamber with an inlet means and an outlet means at opposite ends, with a substantially unimpaired path extending from the inlet means to the outlet means, with discharge means at the inlet end below or downstream from the inlet means, with vertically-disposed condensing means at the outlet end, with means to maintain a substantially constant temperature throughout the chamber, with vacuum means (a) to vaporize a component of influent introduced through the inlet means, (b) to maintain a substantially constant pressure throughout the chamber and (c) to produce and maintain a saturated-vapor atmosphere of the component throughout said chamber at the substantially-constant temperature, and with supplementary means, separate and distinct from the vacuum means, to assist in initiating and/or maintaining flow of the saturated vapor from the inlet means to the condensing means,

the single chamber having a substantially circular cross-section, providing a flow path for the saturated vapor which is substantially constant in cross-sectional area from the inlet means to the condensing means and having a length at least as great as its diameter.

4,292,122

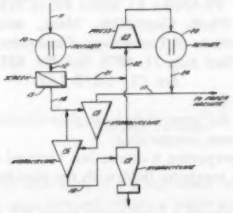
BONDING PROPERTIES OF MECHANICAL PULPS

Alkibiadis Karnis, and John R. Wood, both of Montreal, Canada, assignors to Domtar Inc., Montreal, Canada

Continuation-in-part of Ser. No. 747,878, Dec. 6, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,186

Int. Cl.³ D21B *1/14*

U.S. Cl. 162—28 **4 Claims**



1. A process for producing a mechanical pulp comprising; generating a mechanical pulp from wood material, screening

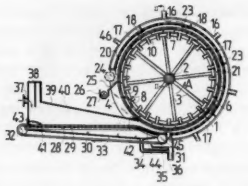
said mechanical pulp into a through fraction and a retained fraction, fractionating by hydrocyclone means substantially all of said through fraction into an underflow fraction containing between about 15 and 70% of said through fraction and having an average specific surface less than the pre-determined value between 1.2 and 4 m^2/g and an overflow fraction having an average specific surface greater than said underflow fraction, subjecting said underflow fraction to a mechanical processing thereby to form a processed fraction having an increased average specific surface value between 4 and 10 m^2/g, combining said processed fraction and overflow fraction into combined pulp having a significantly lower linting propensity than said generated mechanical pulp.

4,292,123

PROCEDURE AND APPARATUS FOR CELLULOSE WASHING

Tuomo Lintunen, and Raimo Kohonen, both of Savonlinna, Finland, assignors to Enso-Gutzeit Osakeytiö , Helsinki, Finland

Filed May 31, 1979, Ser. No. 44,066
Claims priority, application Finland, Jun. 1, 1978, 781743
Int. Cl.³ D21C *9/02*
U.S. Cl. 162—60 **3 Claims**



1. A method for the washing of cellulose pulp in the form of a continuous web comprising passing the web through a washing zone composed of at least two mutually isolated washing zones and passing a washing liquid th.ough the web in a direction countercurrent to that of the direction of travel of the web wherein a clean pressurized washing liquid is passed first into the last of said washing zones through which the web travels and which displaces an equal volume of suspension liquid contained in the web from said zone, said equal volume being displaced into the washing zone next prior to the next subsequent zone, which, in turn, sequentially displaces an equal volume of suspension liquid in the web into the next sequential zone and wherein the suspension liquid displaced from the web by the clean washing liquid is transferred from one washing zone to the next in sequential means by the means of a single pumping operation utilizing the initial pressure of the clean washing liquid.

4,292,124

SYSTEM AND METHOD FOR GENERATING STEADY STATE CONFINING CURRENT FOR A TOROIDAL PLASMA FUSION REACTOR

Nathaniel J. Fisch, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

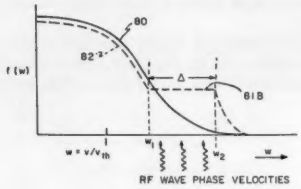
Filed Aug. 21, 1978, Ser. No. 935,222
Int. Cl.³ G21B *1/00*
U.S. Cl. 176—3 **12 Claims**

1. A system for generating steady-state confining current for a toroidal plasma, comprising:

means for preparing a dense, hot toroidal plasma having a confining magnetic field with toroidal and poloidal components;

means for injecting continuous wave RF energy into said plasma to establish a spectrum of traveling waves in said plasma, said traveling waves having momentum components substantially either all parallel or all antiparallel to said confining magnetic field, said injected RF energy being phased to couple to said traveling waves with both a phase velocity component and a wave momentum component in the direction of said traveling wave momentum components, and

said injected RF energy having a predetermined spectrum so that said traveling waves couple to plasma electrons having velocities in a range Δ, said velocities being substantially three to six times the thermal electron velocity of said plasma and said range being sufficiently broad to produce a raised plateau having width Δ of less than twice the electron thermal velocity in the plasma electron velocity distribution so that the plateau electrons provide steady state current to generate a poloidal magnetic field component sufficient for confining said plasma.

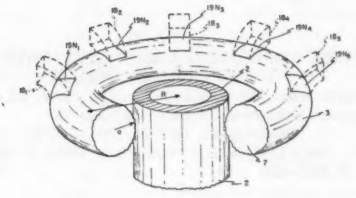


4,292,125

SYSTEM AND METHOD FOR GENERATING STEADY STATE CONFINING CURRENT FOR A TOROIDAL PLASMA FUSION REACTOR

Abraham Bers, Arlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 21, 1978, Ser. No. 935,227
Int. Cl.³ G21B *1/00*
U.S. Cl. 176—3 **6 Claims**



1. A system for generating steady-state confining current for a toroidal plasma exceeding the power dissipated in said plasma, comprising:

means for preparing a dense, hot toroidal plasma having a confining magnetic field with toroidal and poloidal components;

means for injecting continuous wave RF energy into said plasma to establish a spectrum of traveling waves in said plasma, said traveling waves having momentum components substantially either all parallel or all anti-parallel to said confining magnetic field, said injected RF energy being phased to couple to said traveling waves with both a phase velocity component and a wave momentum component in the direction of said traveling wave momentum components, and

said injected RF energy having a predetermined spectrum so that said traveling waves couple to plasma electrons having velocities in a range Δ, said velocities being substantially three to six times the thermal electron velocity of said plasma and said range being sufficiently broad to produce a raised plateau having width Δin the plasma

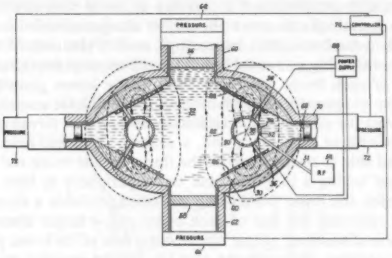
electron velocity distribution so that the plateau electrons provide steady state current to generate a poloidal magnetic field component sufficient for confining said plasma, wherein said RF injection means includes means for coupling to the fast-branch whistler-Alfven wave and to the slow-branch lower-hybrid wave, the electric field of said wave RF energy at the plasma wall having a component substantially perpendicular to the magnetic field confining the plasma, and having a component substantially parallel to the magnetic field confining the plasma, said coupling means comprising an array of rectangular waveguides phased in both the toroidal and poloidal directions, and being slanted with respect to the toroidal magnetic field.

4,292,126

TOKAMAK WITH LIQUID METAL FOR INDUCING TOROIDAL ELECTRICAL FIELD

Tihiro Ohkawa, La Jolla, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 28, 1979, Ser. No. 15,963
Int. Cl.³ G21B *1/00*
U.S. Cl. 176—3 **14 Claims**



1. Tokamak apparatus comprising a vessel for defining a reservoir and confining liquid therein,

a toroidal liner solid structure disposed within said vessel for defining a toroidal space within said liner and confining gas therein,

liquid metal filling said reservoir outside of and completely surrounding said liner,

gas contained in said toroidal space,

means for developing poloidal magnetic flux in said liquid metal linking said toroidal space, said flux being substantially uniformly distributed around the major axis of said toroidal space, and

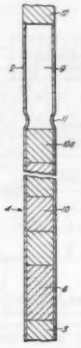
means for moving said liquid metal transversely of said liner to generate substantial toroidal electric current in said gas about the major axis of said toroidal space, said means comprising at least a first and second means, said first means being positioned for substantial movement along said major axis and said second means being positioned for substantial movement along the mid-plane of said toroidal space, the movement of said liquid metal relative to said liner being substantially uniformly distributed around the major axis of said toroidal space and substantially radially inward or outward with respect to said major axis and said movement being substantially symmetrically distributed about the mid-plane of said toroidal space.

4,292,127

NUCLEAR FUEL PINS

Kenneth Hartley; Trevor L. J. Moulding, both of Seascale, and Norman Rostron, Lytham St. Annes, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 3, 1979, Ser. No. 26,803
Claims priority, application United Kingdom, Apr. 14, 1978, 14807/78
Int. Cl.³ G21G *1/02*
U.S. Cl. 176—17 **3 Claims**



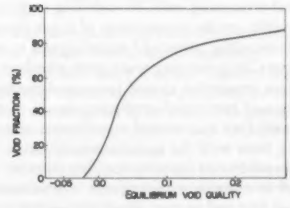
1. A nuclear fuel pin has a central region containing fissile nuclear fuel material in the form of large and small diameter microspheres in which the small diameter microspheres are capable of passing through and packing into the interstices between the large diameter microspheres, axial regions containing breeder material above and below the central region, barrier layers above and below the central region to separate the central region from the axial regions, the barrier layers comprising microspheres having a diameter intermediate the diameters of the large and small diameter microspheres to prevent intermixing of the material in the central and axial regions of the fuel pin.

4,292,128

BOILING WATER TYPE NUCLEAR REACTOR

Renzo Takeda, Hitachi; Kunitoshi Kurihara, Sagamihara, and Sadao Uchikawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 15, 1978, Ser. No. 942,558
Claims priority, application Japan, Sep. 16, 1977, 52-110591
Int. Cl.³ G21C *7/00*
U.S. Cl. 176—20 R **3 Claims**

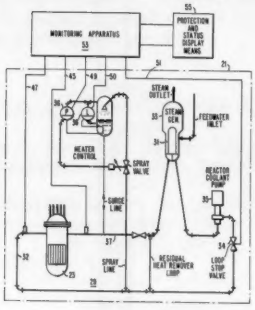


1. A method of operating a boiling water nuclear reactor having a reactor core through which a water coolant is circulated, wherein said core is operated at a void quality (weight ratio of vapor in the coolant) of the coolant at the core outlet of between 17% and 50%.

4,292,129
MONITORING OF OPERATING PROCESSES

Robert F. Barry, Sint Genesius Rode, Belgium, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 14, 1979, Ser. No. 11,986
Int. Cl.[3] G21C 7/00
U.S. Cl. 176—24 14 Claims

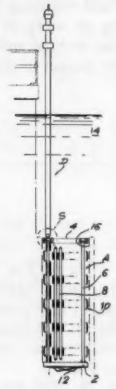


1. Apparatus for monitoring the operation of a nuclear reactor system having a plurality of process states which may be desirably normal or undesirably off-normal, the said reactor having a plurality of means, each responsive to a said process state, to produce a status signal indicative of the status, whether normal or off-normal, of the process state to which it is responsive, the said reactor system also including protective means, the said monitoring apparatus including a first monitoring path including a first signal-processing unit and a second monitoring path including second signal-processing unit, means connecting said status signal-producing means to said first and second signal-processing units when said first or second signal-processing unit is enabled, for transmitting for processing the status signals produced by said status signal-producing means, a signal-evaluating unit, means connecting said signal-processing units to said signal-evaluating units, said signal-evaluating unit including means for evaluating signals processed by said processing units, means connected to each of said signal-processing units, for enabling each of said signal-processing unit to transmit status signals for processing through said signal-processing units, means connected to each of said signal-processing units, for enabling each of said signal-processing units, on the transmission of status signals, to transmit its corresponding processed status signals to said evaluating unit, means for producing test signals simulating said status signals, means connected to said test-signal-producing means, for enabling said test-signal-producing means to transmit test signals to said first and second signal-processing units, on a time-sharing basis with the transmission of status signals, during the times when said signal-processing units are not enabled as aforesaid to transmit status signals, the connecting means between said first and second signal-processing units and said evaluating unit including means for transmitting indication of detected faults, if any, to said evaluating unit, means connecting said evaluating unit to said protective means, for actuating said protective means on the evaluation by said evaluating means of a manifestation of off-normal operation or of detection of faults in both said signal-processing units.

4,292,130
REMOTELY ASSEMBLABLE AND DISASSEMBLABLE FUEL ASSEMBLY FOR NUCLEAR REACTORS

Jean-Luc Viaud, PA.5, 72 Les Jardins de Bures, 91440 Bures-sur-Yvette, and Jacques Lévy, 4, rue Maria Deraisnes, 75017 Paris, both of France

Filed Mar. 7, 1979, Ser. No. 18,222
Int. Cl.[3] G21C 19/20
U.S. Cl. 176—30 7 Claims



1. A remotely assemblable and disassemblable fuel assembly comprising a mechanical structure constituted by an upper plate, a lower plate and a plurality of brace rods extending between said plates, and a plurality of elongated fuel elements fixed to the brace rods by gratings, one of the ends of each brace rod being irremovably fixed in the upper plate, the other end of each brace rod being fixed to the lower plate by a system of remotely assemblable and disassemblable assemblies, wherein the said system of assemblies comprises a thread made at the end of each brace rod, a screwing member having a thread able to cooperate with the thread on the brace rod and a head having a plug hole and on its periphery at least one chamfer, the lower plate being machined to define a through bore receiving the end of each brace rod, a larger diameter portion of said bore issuing into an outer face of the lower plate and receiving the screwing member and an annular groove surrounding said larger diameter portion and issuing into said outer face, the larger diameter portion of said bore and said annular groove defining a flange integral with the lower plate therebetween, said flange being adapted to be crimped on said chamfer of the screwing member to prevent removal of the latter.

4,292,131
COUPLING MECHANISM OF CONTROL ROD FOR NUCLEAR REACTOR

Tomohiro Suzuki, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1978, Ser. No. 917,180
Claims priority, application Japan, Jun. 20, 1977, 52/73692
Int. Cl.[3] G21C 7/14
U.S. Cl. 176—36 C 5 Claims

1. A coupling mechanism for detachably coupling a control rod of a nuclear reactor to a control rod driving apparatus, comprising:

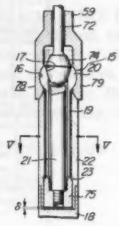
driving extension shaft means connected at one end thereof to said control rod driving apparatus;

gripper means formed at the other end of said driving extension shaft means and including an engaging portion;

control rod extension shaft means arranged coaxially with said driving extension shaft means;

finger means mounted at one end of said control rod exten-

sion shaft means and provided with an engaging portion adapted to come into engagement with said engaging portion of said gripper means, said finger means having resilience sufficiently high to enable the engaging portion thereof to be released from engagement with said engaging portion of said gripper means by the weight of the control rod;



cam shaft means adapted to be actuated by latch means for reciprocatory movement independently of said driving extension shaft means; and

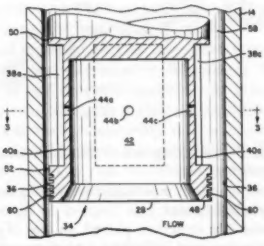
cam means supported at one end of said cam shaft means and adapted to control the engagement of the engaging portion of said finger means with the engaging portion of said gripper means.

4,292,132

HYDRAULICALLY CENTERED CONTROL ROD

Glen E. Schukei, South Windsor; Walter R. Horlacher, III, Simsbury, and William T. Sampson, Windsor Locks, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1979, Ser. No. 55
Int. Cl.³ G21C *7/16*
U.S. Cl. 176—36 S **16 Claims**



1. In a nuclear reactor core having a liquid coolant pumped upward therethrough and a cylindrical control rod vertically reciprocable therein from a unique withdrawn position at the upper end of the core, the combination comprising:

a control rod having a generally cylindrical bearing portion at its lower tip, the bearing including a plurality of discrete pockets circumferentially spaced around the outer surface thereof;

a cylindrical guide tube through which the rod reciprocates, the tube having an upward flow of liquid passing between said pockets and the inner wall of said guide tube;

means for additionally introducing a portion of said pumped liquid directly into each of the pockets at substantially equal flow when the rod is in said unique position;

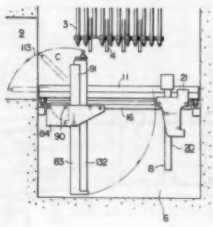
whereby when the rod tip approaches any inner surface of the tube, the distribution of static pressures in the pockets will tend to keep the rod tip off the guide tube.

4,292,133

METHOD OF AND APPARATUS FOR REPLACING CONTROL ROD DRIVE

Masayoshi Sasaki; Yoshimi Ishii; Tomiharu Yoshida, all of Hitachi, and Sen Sugiyama, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1979, Ser. No. 23,902
Claims priority, application Japan, Mar. 24, 1978, 53-33101; May 4, 1978, 53-52754; Sep. 4, 1978, 53-107643
Int. Cl.³ G21C *19/20, 7/08*
U.S. Cl. 176—36 R **28 Claims**



1. A method of replacing a control rod drive comprising the steps of:

detaching said control rod drive from a pressure vessel disposed in a containment vessel of a nuclear reactor by means of a control rod drive attaching and detaching device capable of moving on a revolving device;

moving a control rod drive handling device into contact with said control rod drive attaching and detaching device, said control rod drive handling device being capable of moving on said revolving device separately from and independently of said control rod drive attaching and detaching device;

transferring said control rod drive from said control rod drive attaching and detaching device to said control rod drive handling device; and

bringing said control rod drive, held in a vertical position in said control rod drive handling device, into a horizontal position by means of said control rod drive handling device, after said control rod drive handling device is released from said control rod drive attaching and detaching device.

4,292,134

BIOLOGICAL SHIELD FOR INSULATING PRESSURE VESSELS

Olle Eriksson, Vesteras, Sweden, assignor to Ab Asea Atom, Sweden

Filed Mar. 1, 1979, Ser. No. 16,634
Claims priority, application Sweden, Mar. 6, 1978, 02489/78
Int. Cl.³ G21C *9/00*
U.S. Cl. 176—38 **14 Claims**

1. An improved biological shield assembly for surrounding a nuclear reactor pressure vessel, and comprising:

an open-ended hollow body of caste concrete-like material of substantially cylindrical configuration, having an inner surface surrounding and spaced from an outer surface of said nuclear reactor pressure vessel to define a gap of appreciable size therebetween;

a metallic lining assembly positioned in said gap and having an inner surface confronting and spaced from said nuclear reactor pressure vessel;

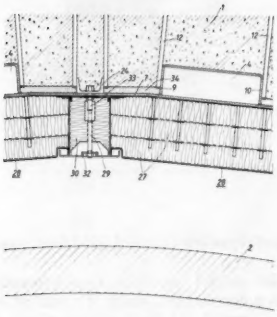
a plurality of separate attachment bars each extending from said metallic lining assembly into portions of said caste concrete-like material to fixedly attach said metallic lining assembly to said hollow body;

thermal insulating means surrounding and permanently spaced an appreciable distance from said pressure vessel for thermally insulating said hollow body from heat radi-

ating radially outwardly from said nuclear reactor pressure vessel;

a plurality of separate blow-out openings each extending through said hollow body of concrete-like material and joining said gap with surrounding ambient atmosphere for rapidly dissipating steam or the like released into said gap from said nuclear reactor pressure vessel;

a plurality of dip-galvanized metallic cooling passageway means each positioned adjacent the inner surface of said



hollow body and welded to an outer surface of said metallic lining assembly for conveying heat away from said hollow body;

each of said passageway means comprising substantially vertically extending first and second sections each extending from said lining assembly toward said hollow body and a third section joining said first and second sections to form a closed passageway with said metallic lining assembly for conveying heat away from said hollow body and metallic lining assembly.

4,292,135

MULTISTAGE-EXPANSION EVAPORATOR

Dick G. Klaren, Hillegom, Netherlands, assignor to Gustav Adolf Pieper, Heemstede, Netherlands

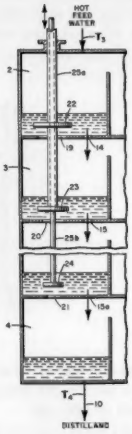
Continuation of Ser. No. 875,565, Feb. 6, 1978, abandoned, which is a continuation of Ser. No. 685,180, May 11, 1976, abandoned. This application Oct. 2, 1979, Ser. No. 81,142

Claims priority, application Netherlands, May 20, 1975, 7505869

Int. Cl.³ B01D *1/30, 3/06*

U.S. Cl. 202—173 **5 Claims**

1. A vertical multistage expansion evaporator comprising contiguous vertically arranged evaporator compartments, said contiguous compartments having a common ceiling and floor, said common ceiling and floor defining a passage means therethrough to permit communication between contiguous compartments, each compartment further comprising a vertical separating wall extending partially the distance from said floor to said ceiling to form a section of said compartment to confine liquid therein and a vapor section, said liquid through said passage means being permitted to flow into a vapor space above the liquid of the compartment next below, flow control means for said liquid positioned at each passage means and adjusting means interconnecting said flow control means and extending through all ceilings of the compartments to outside said evaporator thereby adjusting from outside the compartments simultaneously by a single adjusting operation all flow control means, said adjusting means comprising a plurality of



throughgoing coaxial shafts with flow control means connected thereto.

4,292,136

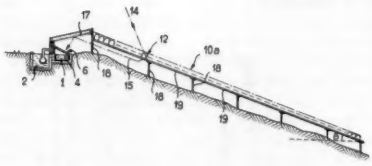
DEVICE FOR DESALTING SEA OR BRACKISH WATER BY USING SOLAR ENERGY

Philippe Clavier, Marly-le-Roi, France, assignor to Spie-Batignolles, Puteaux, France

Filed Aug. 28, 1979, Ser. No. 70,498

Int. Cl.³ B01D *1/00*

U.S. Cl. 202—234 **6 Claims**



1. A device for desalting sea or brackish water using solar energy comprising:

two adjacent canals or equivalent structures both fed by said sea or brackish water;

a greenhouse like structure placed on one of said canals to vaporize water and including a transparent pane slanted with respect to the horizontal forming a top of the structure;

a second structure for condensating the vaporized water and recovering the condensed water, said second structure being in fluid communication with said greenhouse like structure and mostly immersed in the other of said two canals, the water in the second canal acting as a cold source for condensating the vaporized water;

roof means for forming a roof positioned above said pane of said greenhouse like structure, said roof means having a reflecting lower surface slanted with respect to the horizontal; and

means for concentrating solar rays comprising a plurality of panels extending longitudinally away from said roof means, each of said panels being comprised of at least one cell having a transparent upper surface and a reflecting surface so positioned as to direct rays passing through the upper surface of the cell towards the reflecting lower

surface of said roof means in such manner that the rays are reflected by said reflecting lower surface through said transparent pane into the interior of said greenhouse like structure to thereby vaporize water from said one of said canals.

4,292,137

DOOR LIFTER FOR COKE OVEN

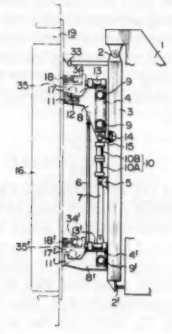
Kenji Fujita; Yuji Shibata; Hisao Mikuni, all of Yokosuka, and Tsuneo Shibuya, Okazaumachi, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Sep. 5, 1980, Ser. No. 184,308

Claims priority, application Japan, Sep. 7, 1979, 54-114883; Sep. 22, 1979, 54-122481

Int. Cl.³ C01B *25/14*

U.S. Cl. 202—248 **6 Claims**



1. A door lifter for coke ovens comprising:

a movable frame movable toward or away from an oven door;

a frame suspended vertically from said movable frame;

means for suspending said frame from said movable frame;

a movable member with at least one hook which is movable vertically along said suspended frame; and

actuator means mounted on said suspended frame and connected to the movable member for causing the vertical movement of said movable member, said actuator means comprising two hydraulic cylinders connected in series and in back-to-back relationship with a common axis of said two hydraulic cylinders in parallel with the path for vertical movement of said movable member, each cylinder having a piston rod; and

a control system to control said two hydraulic cylinders comprising:

first means connected to one of said two hydraulic cylinders for actuating said one of said two hydraulic cylinders to lift said movable member:

means associated with said first means for actuating for sensing the engagement of said at least one hook with a lug piece of said door and thereupon stopping and locking said one hydraulic cylinder;

second means connected to the other of said two hydraulic cylinders and said means for sensing for actuating the other hydraulic cylinder upon the stopping and locking of the one hydraulic cylinder to lift said door to the stroke end of said piston rod of said other hydraulic cylinder, and thereafter to lower said door; and

means for sensing the lowering of said door and for stopping said second means and locking said other hydraulic cylinder when said door reaches a predetermined height;

all of said means of said control system being reversible.

4,292,138

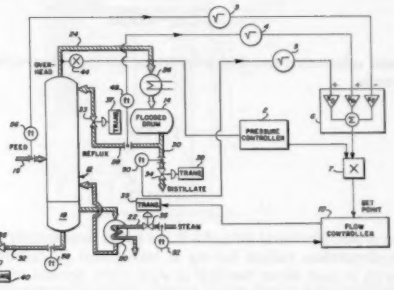
ENERGY BALANCE CONTROL FOR FRACTIONATION TOWER

Robert M. Wright, Dickinson, and Allan W. Johncock, Texas City, both of Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 614,205, Sep. 17, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,517

Int. Cl.³ B01D *3/42*

U.S. Cl. 203—2 **5 Claims**



1. A method for controlling a fractionation tower and process wherein feed and heat flow into the tower and feed is distilled and separated into distillate and bottoms, said distillate flowing from the tower through an overhead line into a condenser where it is condensed before it is drawn off as product with a portion of this product being returned to the tower as reflux, and said bottoms being allowed to at least partially collect in the tower thereby establishing a liquid level which is allowed to fluctuate within predetermined limits, which method comprises: monitoring the pressure within said tower; providing a signal thereof and transmitting said signal to a pressure controller; utilizing said pressure controller to generate a scaled ouput signal which increases when the measured pressure decreases and vice versa; simultaneously generating and using a composite signal:

$$Q_I = K_p(K_R + K_D - K_F)$$

where

Q_I is the heat required by the fractionation tower;

K_p is the pressure controller output signal;

K_R is the reflux flow rate signal;

K_D is the distillate flow rate signal;

K_F is a scaled feed flow rate signal; and; transmitting said composite signal to a second controller which controls heat input to provide an energy balanced and stable fractionation tower and process even during periods of severe and extreme operating conditions by controlling amount of reflux and heat into said tower and amount of distillate and bottom exiting said tower.

4,292,139

METHOD FOR INHIBITING DEPOSIT FORMATION IN DISTILLATION UNITS ASSOCIATED WITH SEPARATION AND PURIFICATION OF ALKYL PHOSPHOROCHLORIDOTHIOATES

Ellis B. Rifkin, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

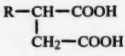
Continuation-in-part of Ser. No. 74,505, Sep. 11, 1979, abandoned. This application Oct. 30, 1980, Ser. No. 202,126

Int. Cl.³ B01D *3/34;* C07F *9/02*

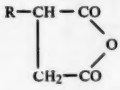
U.S. Cl. 203—6 **18 Claims**

1. A method for inhibiting or preventing the accumulation of oxygenated phosphorus compound impurities in the distillation columns and column reboiler units associated with the separation and purification of O,O-dialkyl phosphorochloridothioates from a crude feed stock containing said O,O-dialkyl phos-

phorochloridothioates admixed with said deposit-forming and fouling-causing oxygenated phosphorus compound impurities which comprises distilling said O,O-dialkyl phosphorochloridothioate containing feed stock in the presence of a minor proportion of an acylated amine prepared by mixing a substituted succinic compound selected from the class consisting of substituted succinic acids having the structural formula:



and substituted succinic anhydrides having the structural formula:



in which structural formulas R is a large, substantially aliphatic hydrocarbon radical having at least about 50 carbon atoms, with at least about one-half an equivalent amount of an ethylene amine and heating the resulting mixture to effect acylation and remove the water formed thereby.

4,292,140

PROCESS FOR RECOVERING HEAT IN DISTILLATION PROCESS

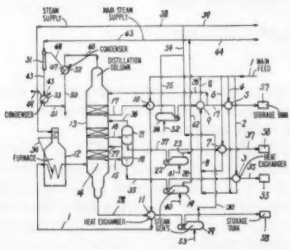
Hiroaki Kawasaki, Ichihara, and Shigeharu Akashi, Narashino, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Idemitsu Kosan Company Limited, both of Tokyo, Japan

Filed Feb. 12, 1980, Ser. No. 120,765

Claims priority, application Japan, Feb. 13, 1979, 54-15175

Int. Cl.³ B01D *3/14;* C10G *7/00*

U.S. Cl. 203—22 **6 Claims**



1. In a fractional distillation process for fractionating a feed in a distillation column to obtain various fractions and bottom product, the process for recovering heat in a distillation processing installation comprising the steps of

(a) branching a main flow of the feed into a plurality of flows,

(b) preheating said branched flows of the feed with sensible heats of the fractions flowing out of the distillation column in heat exchange therebetween,

(c) joining said preheated branched flows to said feed,

(d) preheating said feed having been joined with said preheated branched flows with sensible heats of at least one of the fractions and bottom product flowing out of the distillation column in heat exchange therebetween,

(e) feeding the preheated feed to the distillation column through a heating furnace thereby fractionating the same into a plurality of flows of fractions depending upon difference in boiling temperature among said fractions,

(f) generating saturated steam under pressure of higher than 15 kg/cm² G by heating boiler water with sensible heats of at least one of said fractions having higher boiling temperature among said fractions in heat exchange therebetween in at least one first steam generator,

(g) thereafter preheating at least one of said branched flows of the feed in heat exchange with the same with at least said one of said fractions having higher boiling temperature thereby cooling at least said one of said fractions to a temperature at which it may be safely stored in its storage tank,

(h) preheating the feed having been joined with the branched flows with sensible heats of another at least one of said fractions having lower boiling temperature than that of the first-mentioned at least one of said fractions, and in heat exchange therebetween,

(i) generating saturated steam under pressure of higher than 5 kg/cm² G by heating boiler water with sensible heat of said another at least one of said fractions in heat exchange therebetween in at least one second steam generator,

(j) and then preheating another at least one of said branched flows in heat exchange of the same with said another at least one of said fractions having lower boiling temperature thereby cooling said another at least one of said fractions to a temperature at which it may be safely stored in its storage tank.

4,292,141

ISOLATION OF BUTADIENE FROM A C4-HYDROCARBON MIXTURE

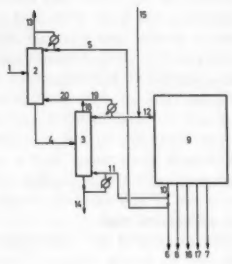
Alfred Lindner, Bobenheim-Roxheim; Klaus Volkamer, Frankenthal; Ulrich Wagner, Limburgerhof; Dieter Pommer, Weisenheim; Klaus-Juergen Schneider, Neustadt, and Harald Schwentker, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,741

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840124

Int. Cl.³ B01D *3/40;* C07C *7/08*

U.S. Cl. 203—49 **6 Claims**



1. A process for isolating butadiene, with the aid of a selective solvent, from a C4-hydrocarbon mixture which contains butadiene, small amounts of styrene, hydrocarbons more soluble than butadiene in the selective solvent and hydrocarbons less soluble than butadiene in the selective solvent, which process comprises:

(a) subjecting the styrene-containing C4-hydrocarbon mixture to distillation in a distillation zone upstream of an extractive distillation in a butadiene isolation plant,

(b) feeding at the same time a second stream of liquid or gaseous C3- and/or C4-hydrocarbons to the upstream distillation zone at or below the point where the styrene-containing C4-hydrocarbon mixture is fed to the upstream distillation zone,

(c) removing a mixture of styrene and C4-hydrocarbons from the C4-hydrocarbon mixture as bottom product of the upstream distillation zone and obtaining as top product

of the upstream distillation zone a styrene-free C_4-hydrocarbon mixture, and

(d) subjecting the styrene-free C_4-hydrocarbon mixture to extractive distillation with the aid of the selective solvent in the downstream butadiene isolation plant,

(e) wherein the styrene-free C_4-hydrocarbon mixture is separated into a distillate containing the hydrocarbons less soluble than butadiene, a stream containing butadiene and a stream containing the hydrocarbons more soluble than butadiene.

4,292,142

SEPARATION OF ETHYLBENZENE FROM PARA- AND META-XYLENES BY EXTRACTIVE DISTILLATION

Lloyd Berg, Bozeman, Mont., assignor to International Synthetic Rubber Co., Ltd., Southampton, England

Filed Jan. 12, 1981, Ser. No. 224,175
Int. Cl.³ F01D *3/40*
U.S. Cl. 203—51 **18 Claims**

1. A method for the separation of ethylbenzene from p-xylene and/or m-xylene which comprises distilling a mixture of ethylbenzene and p-xylene and/or m-xylene in the presence of an effective amount of an extractive agent comprising a mixture of phthalic anhydride and maleic anhydride.

4,292,143

METHOD OF MAKING SINTERED PLAQUE NICKEL ELECTRODES

Harvey N. Seiger, and Vincent J. Puglisi, both of Waterford, Conn., assignors to Yardney Electric Corporation, Pawcatuck, Conn.

Continuation of Ser. No. 967,652, Dec. 8, 1978, abandoned, which is a continuation of Ser. No. 856,381, Dec. 1, 1977. This application Mar. 3, 1980, Ser. No. 126,640
Int. Cl.³ H01M *10/44*; C25D *11/00*
U.S. Cl. 204—2.1 **11 Claims**

1. An improved single step method of making sintered plaque nickel electrodes, said method comprising the single step of uniformly electrochemically depositing nickel hydroxide from a a heated aqueous alcohol-free electrolyte at a substantially constant current and a current density not in excess of about 1 A/in^2 (2.2 A/cc of void volume) into the pores of a clean sintered nickel plaque cathode at acid pH in a treating zone containing an anode, the deposition being continued only until the loading level of said nickel hydroxide throughout said sintered nickel plaque electrode reaches a uniform level not in excess of about 2 gm/cc of void volume, thereby avoiding thickening and swelling of the plaque cathode in excess of about 4%, the electrochemical deposition time being defined by the equation

$$t_{(hours)} = 0.768 \frac{\text{void volume} \times \text{loading level}}{\text{current density}}$$

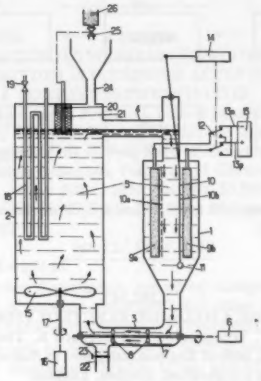
4,292,144

PROCESS AND DEVICE FOR COATING SMALL-SIZED ELEMENTS WITH A METAL DEPOSIT

Pierre J. Lepetit, Saint-Vrain, and Emile J. Genieys, Paris, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, France

Filed Jun. 26, 1980, Ser. No. 163,326
Claims priority, application France, Jun. 29, 1979, 79 17046
Int. Cl.³ C25D *5/08, 17/16*
U.S. Cl. 204—23 **9 Claims**

1. A process for coating small-sized elements with a metallic coat by electrolysis from an electrolyte, the temperature and the ion content of the metal to be deposited of which are maintained substantially constant and in which the polarity of the electrodes is periodically reversed, characterized in that it comprises maintaining these elements in suspension in the electrolyte, causing the electrolyte with the elements in suspension to flow in a closed loop and to pass between two electrodes, disposing a protecting screen in the vicinity of the positive maintained electrode and periodically moving the



protecting screen from the vicinity of the positive maintained electrode to the vicinity of the negative maintained electrode and reversing the flow of current such that the negative maintained electrode becomes the positive maintained electrode.

4,292,145

ELECTRODEPOSITION OF MOLTEN SILICON

Robert C. De Mattei, Sunnyvale; Dennis Elwell, Palo Alto, and Robert S. Feigelson, Saratoga, all of Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed May 14, 1980, Ser. No. 149,567
Int. Cl.³ C25B *1/00*
U.S. Cl. 204—60 **19 Claims**

1. A method of reducing silicon dioxide to silicon in molten form by electrodeposition comprising:

(a) dissolving silicon dioxide in a molten electrolytic salt bath,

(b) passing a direct current between an anode and a cathode in the electrolytic salt bath to reduce said dissolved silicon dioxide to a product consisting essentially of non-alloyed silicon, said bath being maintained at a sufficiently high temperature in excess of 1420° C. for said thus-formed reduced silicon to be in molten form, said electrolytic salt bath being stable at said maintained temperature, and

(c) removing said reduced silicon from said electrolytic salt bath, said silicon being essentially free from bath salt inclusions.

4,292,146

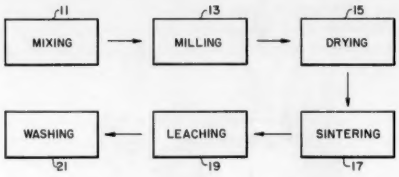
POROUS POLYFLUOROALKYLENE SHEET USEFUL FOR SEPARATING ANOLYTE FROM CATHOLYTE IN ELECTROLYTIC CELLS

Eng-Pi Chang, Grand Island; Christine A. Lazarz, and Edward H. Cook, Jr., both of Niagara Falls, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Aug. 7, 1979, Ser. No. 64,615
Int. Cl.³ C25B *1/34, 13/08*
U.S. Cl. 204—98 **16 Claims**

1. A porous polyfluoroalkylene sheet, suitable for use as a separator in an electrolytic cell, having a porosity in the range

of 70 to 90%, a thickness in the range of 0.2 to 3.5 mm. and (a) an A X-ray ratio in the range of 0.1 to 0.35 and (b) a B_1 X-ray



ratio in the range of 0.1 to 0.32 and a B_2 X-ray ratio in the range of 0.75 to 0.98.

4,292,147

ZINC CHLORIDE ELECTROLYSIS

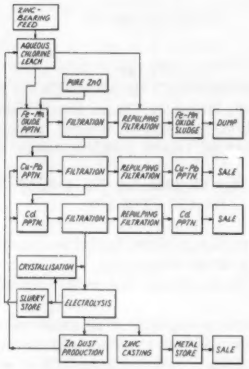
Derek J. Fray, Trumpington, and Bernard K. Thomas, Pelsall near Walsall, both of England, assignors to National Research Development Corporation, London, England

Filed Jun. 20, 1980, Ser. No. 161,644

Claims priority, application United Kingdom, Jun. 22, 1979, 21893/79

Int. Cl.³ C25C *1/16*

U.S. Cl. 204—118 **11 Claims**



1. A process for electrolysing an aqueous solution of zinc chloride having a concentration of 15–35 weight %, the solution arising from leaching a zinc-containing material using an aqueous substantially saturated chlorine solution, the electrolysis proceeding at pH 2–3.5 below 35° C. with gas agitation at a current density exceeding 1000 A/m^2, thereby yielding coherent zinc at the cathode.

4,292,148

POST-TREATMENT OF ETCHED ALUMINUM CAPACITOR FOIL

Walter J. Bernard, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 7, 1980, Ser. No. 175,986

Int. Cl.³ C25F *1/00*

U.S. Cl. 204—144 **4 Claims**

1. A process for removing residual chlorides from electrochemically etched aluminum foil comprising coupling the foil by spaced coupling means to an electrode inert to nitric acid and having a low hydrogen overvoltage while contacting the foil with nitric acid, said electrode being cathodic to said aluminum foil.

4,292,149

CURRENT ROPE ANODES

Michael A. Warne, Brewood, England, assignor to IMI Marston Limited, Wolverhampton, England

Filed Jan. 8, 1980, Ser. No. 110,453

Claims priority, application United Kingdom, Jan. 19, 1979, 02086/79

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—147 **15 Claims**

1. A cathodic protection anode assembly comprising a rope having two or more strands helically wound around one another, at least one anodically polarisable material in the form of an elongate member wound helically around the rope and lying in a depression between the strands and being electrically insulated from the rope, and means to connect in use, the anodically polarisable material to a source of electrical current.

4,292,150

IODINE TREATED ELASTOMERIC ARTICLE

Milton Farber, Bethany, Conn., and Nancy S. Mariotti, Buchanan, Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jun. 26, 1979, Ser. No. 52,166

Int. Cl.³ C08F *2/48*

U.S. Cl. 204—159.12 **37 Claims**

1. An elastomeric article suitable for printing comprising (A) an insolubilized natural or synthetic conjugated diolefin hydrocarbon homopolymer or copolymer, (B) between about 5 and 50 phr of a photopolymerized cross-linking agent derived from a photopolymerizable ethylenically unsaturated compound and (C) between about 0.1 and 5 phr of a photoinitiator activatable by actinic radiation, said elastomeric article containing (D) a detackifying amount of iodine.

4,292,151
PROCESS FOR PREPARING A CURED COPOLYETHERESTER ELASTOMERIC COMPOSITION

Hiroo Inata; Makoto Ogasawara; Tsuto Morinaga, and Akihiro Horike, all of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 27, 1979, Ser. No. 15,798
Claims priority, application Japan, Mar. 1, 1978, 53/23387; Jul. 3, 1978, 53/79776
Int. Cl.[3] C08L *67/02;* C08G *63/16*
U.S. Cl. 204—159.15 10 Claims

1. A process for preparing a cured copolyetherester elastomeric composition comprising following steps I and II:

Step I: melt-extruding an uncured linear copolyetherester elastomeric composition of [A] and [B] to follow:

[A] a linear saturated copolyetherester elastomer composed of

(A-1) a hard segment consisting of

(i) an acid component of which at least 70 mol % is an aromatic dicarboxylic acid and

(ii) a diol component having an average molecular weight of up to 350, and

(A-2) a soft segment consisting of

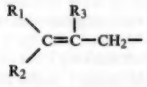
(iii) a polyalkylene glycol having an average molecular weight of from 500 to 5,000 in an amount of from 10 to 80% by weight based on the elastomer [A]; and

[B] a compound having an unsaturated aliphatic moiety other than unsaturated conjugated

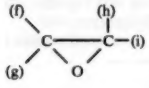
moieties, said compound [B] being copolymerized or blended with said elastomer [A], wherein said unsaturated aliphatic moiety is chemically inert at the melt-extruding temperature, the amount of said moiety being 0.001 to 0.5 equivalent per 100 grams of said elastomer [A], said compound [B] being represented by the following formula

$$\{(AQ_4)_{f_1}X_1)_{f_2}Q_6\{Y_1(Q_5B)_{f_3}\}_{f_4} \quad (10)$$

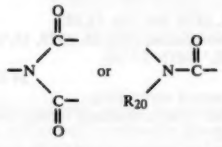
wherein A represents a group of the formula


(2)

wherein R_1, R_2 and R_3 are identical or different, and each represent a group selected from the class consisting of a hydrogen atom and alkyl group with 1 to 6 carbon atoms; B represents an epoxy group of the formula


(9)

in which bonds (f) to (i) are bonded to hydrogen atoms or alkyl groups with 1 to 6 carbon atoms, and bond (i) or bonds (i) and (g) are organic moieties including general formula (2), X_1 represents a direct bond, —O—,



in which R_{20} represents a hydrogen atom, an alkyl group containing 1 to 6 carbon atoms, or AQ_4—; Y_1 represents a direct bond, —O—, or —NH—; Q_6 represents an organic group having a valence of 2 to 4; Q_4 and Q_5 represent a direct bond or an organic group having a valence of 2 to 4; and f_1, f_2, f_3 and f_4 are positive integers.

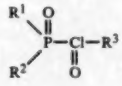
Step II: curing the resulting extrudate by irradiation of actinic light.

4,292,152
PHOTOPOLYMERIZABLE RECORDING COMPOSITION CONTAINING ACYLPHOSPHINE OXIDE PHOTOINITIATOR

Peter Lechtken; Bernd Bronstert, both of Frankenthal; Gerhard Hoffmann, Otterstadt; Rudolf Vyvial, and John Lynch, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 6, 1979, Ser. No. 55,361
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909992
Int. Cl.[3] C08F *2/48*
U.S. Cl. 204—159.15 6 Claims

1. A photopolymerizable recording composition for the preparation of printing plates and relief plates, which consists mainly of a mixture, containing (a) a photoinitiator, (b) one or more monomers possessing one or more photopolymerizable olefinically unsaturated double bonds and (c) one or more organic polymeric binders, the improvement wherein the photoinitiator is an acylphosphine oxide compound of the formula


(I)

where

R^1 is alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 or 6 ring carbon atoms, aryl which is unsubstituted or substituted by halogen, alkyl or alkoxy, or an S-containing or N-containing five-membered or six-membered heterocyclic radical,

R^2 has the same meanings as R^1, or is alkoxy, aryloxy or aralkoxy, R^1 and R^2 being the same or different or together form a ring, and

R^3 is tertiary alkyl of 4 to 18 carbon atoms or tertiary cycloalkyl of 5 or 6 ring carbon atoms or is a cycloalkyl, aryl or 5-membered or 6-membered heterocyclic radical containing S, N or O as hetero atoms which contains substituents A and B bonded at least to the two ring carbon atoms, capable of substitution, which are adjacent to the point of attachment of the carbonyl group to the carbonyl group, A and B being identical or different and each being alkyl, alkoxy, alkoxyalkyl, alkylthio, cycloalkyl, aryl or halogen.

4,292,153
METHOD FOR PROCESSING SUBSTRATE MATERIALS BY MEANS OF PLASMA TREATMENT

Daijiro Kudo, Yokohama, and Kiyoshi Ikeda, Kitakyusyu, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 14, 1980, Ser. No. 130,537
Claims priority, application Japan, Mar. 19, 1979, 54-32019
Int. Cl.[3] H01L *21/306*
U.S. Cl. 204—164 20 Claims

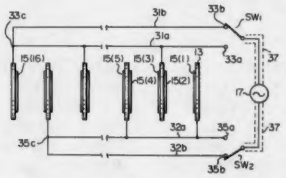
1. A method for processing substrate material by plasma treatment in a reaction chamber, comprising the steps of:

mounting said substrate materials onto a series of electrode plates arranged in parallel to each other;

connecting alternate ones of said electrode plates to alternate ones of a pair of bus lines;

applying high-frequency power between said pair of bus lines for producing plasma between said electrode plates; and

changing the feed points of said high-frequency power on said pair of bus lines so that said plasma treatment is effected substantially uniformly in the spaces between said electrode plates.



4,292,154

BUFFER COMPOSITION AND METHOD FOR THE ELECTROPHORETIC SEPARATION OF PROTEINS

Jeffrey Ambler, Tollerton, England, assignor to Gelman Sciences, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 92,250, Nov. 7, 1979, abandoned. This application Apr. 8, 1980, Ser. No. 138,384

Int. Cl.³ G01N *33/16, 27/26*

U.S. Cl. 204—180 G **11 Claims**

1. A method for electrophoretically separating proteins, said method comprising placing a sample of the proteins to be separated on a substrate, placing the substrate with said sample thereon in an electrically conductive buffer solution, and then passing an electric current through said solution thereby to cause the protein sample to separate, on said substrate, into fractions of different densities or mobilities, said buffer solution having a pH of from 8.2 to 9.0 and containing an acid having the formula R_1—CO—NH—R_2—COOH where R_1 is NH_2, an alkyl group or an aryl group and where R_2 is an alkyl group, and a water soluble salt of the acid.

4,292,155

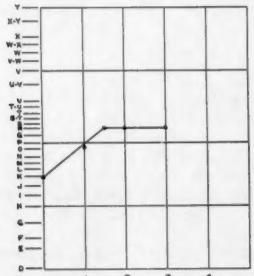
CATIONIC ELECTRODEPOSITION EMPLOYING NOVEL MERCAPTO CHAIN EXTENDED PRODUCTS

Joseph F. Bosso, Lower Burrell; Richard M. Nugent, Allison Park, and Joseph E. Plasynski, Arnold, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 90,166, Oct. 31, 1979. This application Oct. 15, 1980, Ser. No. 197,313

Int. Cl.³ C25D *13/06*

U.S. Cl. 204—181 C **15 Claims**



1. A method for coating a conductive substrate serving as a cathode which method comprises passing electric current between an anode and a cathode in electrical contact with an aqueous resinous dispersion in which the resin comprises the reaction product of:

(A) a polyepoxide having a 1,2-epoxy equivalency greater than one,

(B) a polymercapto compound, and

(C) an amine; the equivalent ratio of mercapto groups in (B) to epoxide groups in (A) being less than one; said reaction product containing cationic groups which are derived from the organic amine.

4,292,156

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

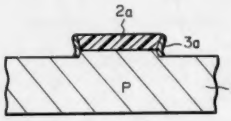
Takashi Matsumoto, and Takahiro Nawata, both of Kawasaki, Japan, assignors to VLSI Technology Research Association, Kawasaki, Japan

Filed Feb. 28, 1979, Ser. No. 15,897

Claims priority, application Japan, Feb. 28, 1978, 53-23086

Int. Cl.³ H01L *21/316, 21/318*

U.S. Cl. 204—192 EC **8 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

selectively masking a region of a silicon semiconductor substrate with an insulating layer of silicon dioxide, in which region a semiconductor circuit element is to be formed;

etching the unmasked region of said silicon semiconductor substrate to form the unetched part of said silicon semiconductor substrate into a mesa like shape;

forming an anti-oxidation masking layer over the entire surface of both of said insulating layer and said silicon semiconductor substrate;

bombarding said anti-oxidation masking layer with ions from a direction which is almost at a right angle to the surface of said silicon semiconductor substrate;

selectively etching said anti-oxidation masking layer to leave a part of said anti-oxidation masking layer on the sides of said insulating layer and on the sides of said mesa shaped part of said silicon semiconductor substrate;

oxidizing the unmasked region of said silicon semiconductor substrate to form a silicon dioxide field oxide layer;

removing said insulating layer from said region of said silicon semiconductor substrate in which said circuit element is to be formed, thereby exposing said region;

removing said anti-oxidation masking layer; and

forming said circuit element in said exposed region.

4,292,157

SOLID POLE OXYGEN SENSOR AND ITS MANUFACTURING PROCESS

Hiroshi Wakizaka, Toyota; Hiroshi Shinohara, Okazaki; Yasuhiro Otsuka, and Shinichi Matsumoto, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 7, 1979, Ser. No. 91,883

Claims priority, application Japan, May 18, 1979, 54/61250

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—195 S **14 Claims**

1. A solid pole oxygen sensor comprising:

a substantially cylindrical ceramic insulator having electroconductive zones; and

an oxygen sensor element joined to one end of the insulator and comprising:

a solid pole coated with an electroconductive paste forming a solid electrode;

a lead wire, one end of which is at least partially coated

with a sealing agent is buried in the solid pole, said lead wire being made of Pt or Pt-Rh; and

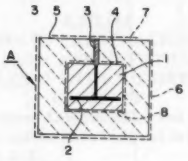
a solid electrolyte in which the solid electrode is encased, the other end of said lead wire being adjacent the periphery of the solid electrolyte.

11. A method of manufacturing a solid pole oxygen sensor, said method comprising:

burying one end of a lead wire made of Pt or Pt-Rh and coated with a sealing agent over a portion of said one end in a solid pole;

coating the surface of the solid pole with an electroconductive paste;

encasing the solid pole in a solid electrolyte;



pressure-molding the solid electrolyte with the solid pole encased therein under a pressure of 600 to 2000 Kg/cm^2;

drying the solid electrolyte with the solid pole encased therein;

firing the pressure-molded solid electrolyte with the solid pole therein at about 1350°–1500° C. in a reducing atmosphere;

plating or baking Pt electrodes on the surface of the solid electrolyte to form an oxygen sensor element; and

joining the oxygen sensor element to one end of a substantially cylindrical ceramic insulator having electroconductive zones thereon to be connected to the Pt electrodes.

4,292,158

OXYGEN SENSOR OF THE POLAROGRAPHIC TYPE, PARTICULARLY FOR USE WITH INTERNAL COMBUSTION ENGINES

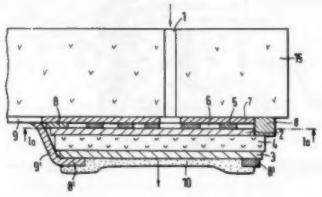
Klaus Müller, Tamm; Helmut Maurer, Schwieberdingen; Hermann Dietz, Gerlingen; Karl-Hermann Friese; Wolfgang Leibfried, both of Leonberg; Günther Stecher, Ludwigsburg, and Ernst Linder, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 157,303

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, 2923483

Int. Cl.[3] **G01N** *27/58*

U.S. Cl. 204—195 S **18 Claims**



1. Polarographic sensor to determine the oxygen content of gases, particularly combustion gases, especially when emanating from an internal combustion engine, and operating in accordance with diffusion limiting current principle having

a solid electrolyte body (**4, 16, 46**);

an anode electrode (**3**) applied to a surface portion of said body;

a cathode electrode (**2**) applied to another surface portion of said body;

means (**9, 9'**) adapted to apply a voltage across said electrodes;

means (**15, 16, 46**) forming a wall separating the cathode from an ambient space in which the gas, the oxygen of which is to be determined, occurs, and an opening formed in said wall to conduct oxygen molecules to the cathode, comprising, in accordance with the invention,

support elements (**5**) located between the cathode and said wall and defining, therebetween, a system of intermediate distribution or dispersion spaces (**6**);

and wherein the opening in said wall comprises at least one hole (**1,31**) which has a length which is long in relation to the diameter of the hole and is in gas communication with said distribution or dispersion spaces.

4,292,159

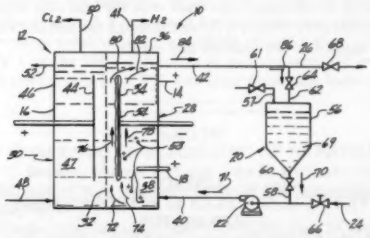
CELL HAVING IN SITU REDUCTION OF ELECTRODE OVERVOLTAGE

Han C. Kuo; Byung K. Ahn; Ronald L. Dotson, and Kenneth E. Woodard, Jr., all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 853,360, Nov. 21, 1977, Pat. No. 4,160,704, which is a continuation-in-part of Ser. No. 792,389, Apr. 29, 1977, abandoned. This application Sep. 6, 1978, Ser. No. 939,942

Int. Cl.[3] **C25B** *15/08, 11/04, 9/00, 1/16*

U.S. Cl. 204—237 **1 Claim**



1. In an electrolytic cell for the electrolysis of brine to form chlorine gas and caustic soda, said cell being of the type having a cathode side which includes a hydrogen gas evolving copper cathode, a cathode chamber adapted to contain a catholyte, a catholyte liquid inlet and a catholyte liquid outlet and having an anode and an anode chamber adapted to contain a non-alkaline anolyte and said anode and having a non-adherent membrane separating said anode chamber and cathode chamber, the improvement which comprises:

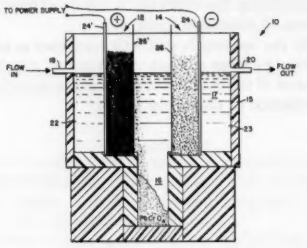
low overvoltage iron ion generator means adapted to be placed in direct fluid communication with said cathode chamber, for generating iron ions and directly introducing said generating iron ions into the catholyte so as to be plated in situ on said cathode during operation of said cell, said iron ion generator means being sufficient to generate enough iron ions that the plated surface of said cathode is at least 99% iron, and means for directly conveying catholyte liquid from said cathode chamber to said generator.

4,292,160

APPARATUS FOR ELECTROCHEMICAL REMOVAL OF HEAVY METALS SUCH AS CHROMIUM FROM DILUTE WASTEWATER STREAMS USING FLOW-THROUGH POROUS ELECTRODES

Paul J. Marcantonio, Lexington, Mass., assignor to Kennecott Corporation, Stamford, Conn.

Filed Aug. 20, 1979, Ser. No. 68,145
Int. Cl.³ C25B *1/00, 11/12, 15/08*
U.S. Cl. 204—237 **6 Claims**



1. A cell for removing chromium ions from waste streams comprising:
   a. a container for holding the waste stream to be treated:
   b. an inlet tube into said container for introducing the waste stream into said container;
   c. an outlet tube in said container for delivering a treated waste stream from said container;
   d. a packed bed of lead shot forming an anode near the inlet of said container;
   e. a cathode of conductive carbonaceous particles near the outlet of said container;
   f. means for applying positive voltage to the bed of lead shot;
   g. means for applying negative voltage to the bed of conductive carbonaceous particles; and
   h. a trap for collecting lead chromate which sloughs off the anode as chromate ions react with the lead shot when the stream to be treated is flowed through the cell and voltage is applied to the cathode and anode.

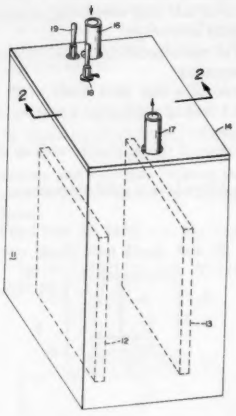
4,292,161

VERTICAL GEL SLAB ELECTROPHORESIS APPARATUS

Peter S. Hoefer, San Francisco, and Michael Whitesides, Daly City, both of Calif., assignors to Hoefer Scientific Instruments, San Francisco, Calif.

Continuation of Ser. No. 714, Jan. 3, 1979, Pat. No. 4,224,134. This application Sep. 22, 1980, Ser. No. 189,601
Int. Cl.³ G01N *27/26*
U.S. Cl. 204—299 R **6 Claims**

1. Vertical gel slab electrophoresis apparatus comprising: a sample unit comprising, a pair of spaced plates, a pair of vertical guide means each having an internal groove for accommodating opposed edges of said spaced plates each of said guide means having at least one external horizontal channel, and a plurality of screw means in said vertical guide means for pressing said plates together and against said internal grooves; means for supporting said sample unit in a vertical orientation; longitudinal resilient sealing means interposed between said sample unit and said supporting means; said supporting means including opposed means extending from said supporting means for receiving said pair of vertical guide means, a pair of cam means mounted for rotation in said extending means, said cam means having an off-center nub which mates with said horizontal channel of each vertical guide means, rotation of said cam means pressing said sample unit against said sealing means and said supporting means.



4,292,162

BUFFER COMPOSITION AND METHOD FOR THE ELECTROPHORETIC SEPARATION OF PROTEINS

Jeffrey Ambler, Tollerton, England, assignor to Gelman Sciences, Inc., Ann Arbor, Mich.

Division of Ser. No. 138,384, Apr. 8, 1980, which is a continuation-in-part of Ser. No. 92,250, Nov. 7, 1979. This application Oct. 16, 1980, Ser. No. 197,391
Int. Cl.³ G01N *33/16, 27/26*
U.S. Cl. 204—299 R **26 Claims**

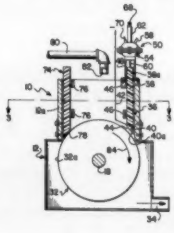
1. A composition for the preparation of a buffer solution for use in the electrophoretic separation of proteins, said composition consisting essentially of 2-amino-2-(hydroxymethyl)-1,3-propanediol, hippuric acid and a water soluble hippurate.

4,292,163

LIQUID TREATER HAVING ELECTRODE STRIPPER

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Filed Jan. 16, 1980, Ser. No. 112,549
Int. Cl.³ B03C *5/02;* **C02F** *1/46*
U.S. Cl. 204—304 **2 Claims**



1. In a device for electrically treating liquids, the combination of:
   a first generally cylindrical electrode mounted for rotation about a generally horizontal axis coinciding with the longitudinal axis of the electrode;
   means for supplying liquid onto the upper peripheral surface of said electrode during rotation thereof about said axis of rotation;

a second, stationary electrode having a surface disposed in spaced opposition to said surface of the first electrode;

means for holding said electrodes with their opposed surfaces spaced apart a fraction of an inch to define a restricted gap which receives the liquid and reduces the same in volume to a thin layer as it moves through said gap, thereby concentrating the effect of the electrodes;

means for connecting said electrodes across a source of electrical potential for oppositely electrically charging the same and producing an electric field within said gap; and

stripper means positioned to engage said surface of said one electrode at a point beyond said gap for removing adhering liquid and other materials from said surface of said one electrode following passage through said gap.

4,292,164
LIQUEFACTION OF CARBONACEOUS MATERIAL WITH HYDROGEN AND NAPHTHA-EXTRACTED RECYCLE SOLVENT WITHOUT HETEROGENEOUS CATALYST

Francis J. Derbyshire, Lawrenceville, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,817
Int. Cl.³ C01G *1/00*
U.S. Cl. 208—8 LE **12 Claims**

1. A process for the liquefaction of solid carbonaceous material which comprises the steps of

(1) forming a slurry of the solid carbonaceous material in a hydrogen transfer solvent;

(2) heating said slurry in the presence of hydrogen in the substantial absence of heterogeneous hydrogenation catalyst at a temperature and pressure sufficient to obtain a conversion of said solid carbonaceous material of at least 60% of a liquid product;

(3) extracting the liquid product boiling above 200° C. with process derived naphtha containing less than 20 percent by weight of aromatics;

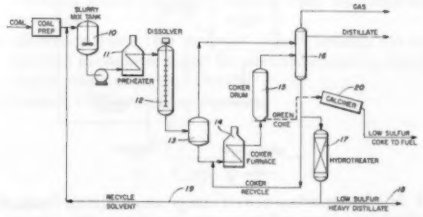
(4) separating from the naphtha the components soluble therein as a recycle solvent; and

(5) recycling at least a portion of said recycle solvent to step (1) as said hydrogen transfer solvent.

4,292,165
PROCESSING HIGH SULFUR COAL

Matthew C. Sooter, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Feb. 7, 1980, Ser. No. 119,322
Int. Cl.³ C10G *1/00, 1/06, 9/14*
U.S. Cl. 208—8 LE **3 Claims**



1. A process for treating high sulfur coal to produce liquids and delayed coke comprising:

(a) subjecting particulate coal having a sulfur content of at least 2 percent by weight to a coal liquefaction step where it is maintained at a temperature of 390° to 505° C. and a pressure of 28 to 140 kg/cm² for a time of 0.2 to 2 hours;

(b) separating gases and light ends produced in step (a) by pressure reduction and passing the remaining material from step (a) to a delayed coker after heating it in a coker furnace to 450° to 525° C.;

(c) recovering overhead vapors from the delayed coker and passing them to a fractionator where a gas-oil fraction is obtained;

(d) recycling a portion of the gas-oil fraction from the fractionator back to the delayed coker;

(e) hydrotreating another portion of the gas-oil fraction from the fractionator and returning at least part of the hydrotreated portion to the coal liquefaction step as recycle solvent;

(f) recovering solid delayed coke from said delayed coker; and

(g) calcining said coke at a temperature of from 1450° to 1600° C. to produce a calcined coke having a reduced sulfur content.

4,292,166
CATALYTIC PROCESS FOR MANUFACTURE OF LUBRICATING OILS

Robert L. Gorring, Washington Crossing, and Rene B. La Pierre, Morrisville, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,661
Int. Cl.³ C10G *45/12, 48/18, 65/02*
U.S. Cl. 208—59 **22 Claims**

19. In a process for catalytically converting a waxy hydrocarbon oil boiling above 650° F. (343° C.) and substantially free of asphalt to a high V.I low pour point lube base stock, which process comprises catalytically dewaxing said oil, the improvement whereby an increased yield of said high V.I. low pour point lube base stock is obtained, which comprises, in combination:

contacting said waxy hydrocarbon oil and hydrogen in a first reaction zone with a zeolite catalyst having a Constraint Index of 1 to 12 and a silica to alumina ratio above 12, said contacting being at a temperature of 400°–1000° F. (204°–537° C.), a pressure of 500–3500 psig, and a L.H.S.V. of 0.1–10 hr^{-1}, thereby dewaxing said oil;

contacting said dewaxed oil and hydrogen in a second reaction zone with a large pore hydrocracking or a hydroconversion catalyst under conditions effective to increase the V.I. of the lube oil fraction of said dewaxed oil; and

recovering said high V.I. low pour point lube base stock.

4,292,167
NOBLE METAL REFORMING OF NAPHTHA

John C. Bonacci, Murray Hill, and John R. Patterson, Haddonfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 53,582, Jun. 28, 1979, abandoned, which is a continuation of Ser. No. 883,104, Mar. 3, 1978, abandoned, which is a continuation of Ser. No. 553,397, Feb. 27, 1975, abandoned. This application Jan. 14, 1980, Ser. No. 111,743
Int. Cl.³ C10G *35/04*
U.S. Cl. 208—66 **8 Claims**

1. In the process of increasing the octane number of naphthas by multi-stage endothermic reforming with a conventional noble metal reforming catalyst utilizing at least three reforming stages in series and including heating said naphtha intermediately between said stages; the improvement; whereby increasing the octane number of said naphtha more efficiently; improving yield and reducing catalyst aging, which comprises: cooling the effluent of said first reforming stage to a temperature in the range of between about 550° F. and 725° F., contacting said cooled effluent with a zeolite catalyst having a silica to alumina ratio of at least about 15 and selected from the group consisting of ZSM-5, ZSM-11, ZSM-35 and ZSM-38; heating the effluent after said contacting and then feeding such heated effluent to the second stage of said reforming process.

4,292,168
UPGRADING HEAVY OILS BY NON-CATALYTIC TREATMENT WITH HYDROGEN AND HYDROGEN TRANSFER SOLVENT

Francis J. Derbyshire, Lawrenceville; Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,949
Int. Cl.³ C10G *9/14, 47/34*
U.S. Cl. 208—107 **20 Claims**

2. A process for upgrading heavy liquid hydrocarbon oil which comprises the steps of

(1) forming a mixture of said heavy liquid hydrocarbon oil, a major fraction of which boils above 425° C., and an organic solvent containing at least 15% by weight of polycyclic hydrogen transfer solvent, said polycyclic hydrogen transfer solvent being free of carbonyl groups and having a polarographic reduction potential which is less negative than phenanthrene and equal to or more negative than azapyrene;

(2) heating said mixture with H_2 in the substantial absence of heterogeneous hydrogenation catalyst at a temperature, under pressure and for a time sufficient to obtain at least 50% conversion of the fraction boiling above 425° C. to products boiling below 425° C. and containing less than 10% by weight of tetrahydrofuran insolubles; and

(3) separating said polycyclic hydrogen transfer solvent from the product of step (2) and recycling it to step (1) without external hydrogenation.

4,292,169
HYDROCARBON CONVERSION WITH ZEOLITE CATALYST IN METALS-ABSORBING MATRIX

Elroy M. Gladrow, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 746,188, Nov. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 626,225, Oct. 28, 1975, abandoned. This application Jan. 8, 1979, Ser. No. 1,722
Int. Cl.³ C10G *9/16, 11/05*
U.S. Cl. 208—120 **20 Claims**

1. A process for the conversion of a hydrocarbon oil which comprises: contacting said oil at hydrocarbon conversion conditions with a catalyst comprising (1) a crystalline aluminosilicate zeolite, said zeolite being present in an amount ranging from about 1 to about 40 weight percent based on the total catalyst, (2) a catalytic inorganic oxide gel, said gel being present in an amount ranging from about 45 to about 98 weight percent, and (3) a porous inorganic oxide initially having a surface area greater than about 200 square meters per gram and having at least 0.2 cubic centimeter per gram of its pore volume in pores ranging in diameter from about 90 to about 200 angstroms, said porous inorganic oxide in itself having less catalytic activity than said inorganic oxide gel component, said porous inorganic oxide being present in an amount ranging from about 1 to about 55 weight percent based on the total catalyst, and said catalyst having at least 0.4 cubic centimeter per gram of its pore volume in pores greater than 90 angstroms in diameter.

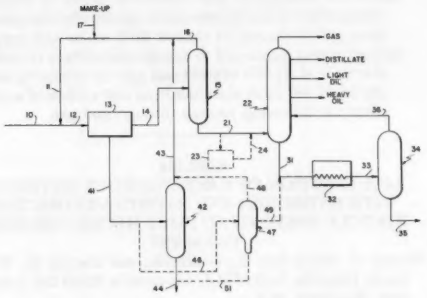
4,292,170
REMOVAL OF QUINOLINE INSOLUBLES FROM COAL DERIVED FRACTIONS

Andre A. Simone, Dover, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 819,772, Jul. 28, 1977, abandoned. This application Jul. 25, 1979, Ser. No. 60,453
Int. Cl.³ C10G *9/14*
U.S. Cl. 208—131 **11 Claims**

1. A process for producing needle coke from a coal tar pitch, comprising:

contacting the coal tar pitch with a liquid promoter which enchances and promotes the separation of quinoline insolubles from the coal tar pitch, said liquid promoter being a hydrocarbon liquid having a 5-volume percent distillation temperature of at least about 250° F. and a 95 volume percent distillation temperature of at least about 350° F. and no greater than about 750° F., said liquid having a characterization factor of at least 9.75;



recovering by gravity settling as an overflow stream a mixture of promoter liquid and a coal tar pitch fraction having a reduced quantity of quinoline insolubles;

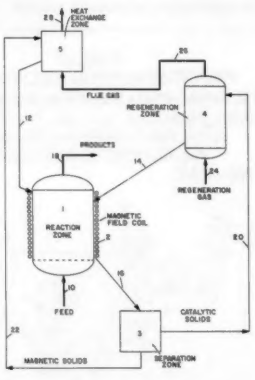
separating said coal tar pitch fraction from the promoter liquid; and

coking at least a portion of said separated coal tar pitch fraction to produce needle coke.

4,292,171
MAGNETICALLY STABILIZED, FLUIDIZED BEDS

Francis X. Mayer, and William F. Arey, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 737,228, Nov. 1, 1976, abandoned. This application Mar. 19, 1980, Ser. No. 131,853
Int. Cl.³ C10G *11/00, 15/00*
U.S. Cl. 208—164 **5 Claims**



1. In a hydrocarbon conversion process wherein fluidizable particulate catalyst solids are circulated between a fluidized bed reaction zone in which said particulate catalyst solids are contacted with a hydrocarbon feedstock resulting in the deposition of coke on said catalyst solids and a fluidized bed regeneration zone in which the catalyst particles having coke deposited thereon are contacted with an oxygen-containing gas to remove said coke by combustion, the improvement which comprises (a) introducing into said reaction zone particulate solids having ferromagnetic properties so that said hydrocarbon feedstock is contacted with a particulate solids mixture

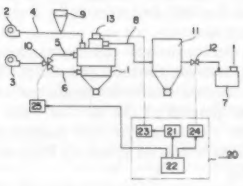
containing a plurality of separate, discrete (1) magnetizable substantially non-catalytic particles, and (2) non-magnetizable catalytic particles; (b) applying a magnetic field to said reaction zone to form a magnetically stabilized fluid bed in said reaction zone; (c) withdrawing said particulate solids mixture from the reaction zone; (d) separating said magnetizable substantially non-catalytic particles from said non-magnetizable catalytic particles; and introducing said non-magnetizable catalytic particles into said regeneration zone.

4,292,172

APPARATUS FOR CLASSIFYING PARTICLES

Masuo Hosokawa, Toyonaka; Tohei Yokoyama, Kyoto, and Noriyoshi Kaya, Hirakata all of Japan, assignors to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, Osaka, Japan

Filed Apr. 15, 1980, Ser. No. 140,508
Claims priority, application Japan, May 28, 1979, 54/65808
Int. Cl.³ B07B *7/083*
U.S. Cl. 209—144 **3 Claims**



1. An apparatus for classifying particles comprising,
a housing **(1)** defining a classifying chamber **(16)**,
a feed duct **(4)** for feeding particles to be treated and a feed duct **(5)** for feeding classifying gas, both connected to said housing **(1)**,
a suction duct **(8)** connected to said housing **(1)** for transmitting gasborne fine particles resulting from a classifying operation, gas flow rate (Q) in said suction duct **(8)** being maintained substantially constant,
a discharge duct **(17)** connected to said housing **(1)** for discharging coarse particles resulting from the classifying operation,
a classifying rotor **(14)** mounted in said housing **(1)** and adapted to rotate at varied frequencies to select a classification standard particle size (d),
a computer **(20)** storing an equation,

$$N = K \cdot \frac{1}{d} \cdot \sqrt{\frac{Q}{\rho s}}$$

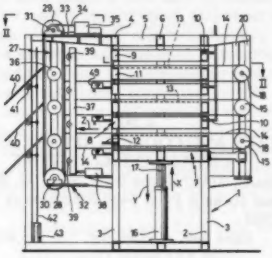
; where K is a constant, for calculating a rotational frequency (N) of said classifying rotor **(14)** from the classification standard particle size (d), density (ρs) of the particles to be treated, and said gas flow rate (Q) in the suction duct **(8)**, said computer **(20)** including at least an input unit **(22)** for establishing said classification standard particle size (d), and a unit **(23)** for automatically adjusting speed of said classifying rotor **(14)** to the rotational frequency (N) derived from an input data of the classification standard particle size (d) and said equation.

4,292,173

VERTICAL FILTERING DEVICE

Alfred H. Parmentier, 69 Blvd. Machtens, B-1080 Brussels, Belgium

Continuation of Ser. No. 37,085, May 8, 1979, abandoned. This application Jun. 18, 1980, Ser. No. 160,707
Claims priority, application France, May 10, 1978, 78 16002; Sep. 26, 1978, 78 27472
Int. Cl.³ B01D *25/34, 25/12*
U.S. Cl. 210—138 **8 Claims**



1. A vertical filtering device comprising:
a framework carrying a plurality of independent horizontal superimposed coaxial filtering units including each:
a frame with an inlet for a slurry to be filtered,
a plate for collecting the filtrate with an outlet for said filtrate, and
an individual endless filtration band supported by two side rollers independently from the frame and the plate of the filtering unit, said filtration band having a section extending between the plate and the frame and another section extending under the plate, the frame, the plate and the individual endless filtration band supported by the side rollers being independent from each other;
opening and closing means for allowing the independent frame, the independent plate and the independent individual endless filtration band of each filtering units and the independent filtering units themselves to be pressed against each other during each filtration step and for allowing said frame, said plate, said individual endless filtration band of each filtering unit, and said filtering units themselves to become spaced apart after each filtration step,
separate vertical guiding posts provided with slidably movable bearings in which the ends of a shaft carrying the rollers supporting each endless filtration band are inserted, stops being carried by said guiding posts for maintaining said bearings at predetermined levels in the open position of the filtering device,
vertical guiding means for the independent frames and plates of each filtering unit, said means comprising a portion having the shape of a flight of stairs, the vertical face of each stair acting as a guide for staggered projections of the frames and of the plates, whereas the horizontal faces of the stairs act as stops for limiting the downward movement of said projections of the frames and plates when the filtering device is opened,
means for simultaneously moving the individual endless filtration bands of the various filtering units, comprising a driving element operable to act simultaneously on one roller of each pair of independent side rollers supporting an endless filtration band and cause the said rollers to rotate for bringing the section of each endless filtration band supporting a filtration cake into a position where the filtration cakes are discharged from the said band, each of said discharge positions being on the same side of the filtering device, and
common controlling means including a cam programmer for

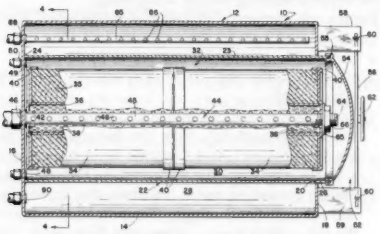
sequentially controlling the durations of the steps of closing the filtering device by pressing the filtering units against each other, of filtering a slurry in the various filtering units, of washing the filtration cakes, of dewatering these cakes, of opening the filtering device by allowing the filtering units and the parts thereof to become spaced from each other, and of moving the endless filtration bands towards the filtration cake discharge position.

4,292,174

FILTER AND COOLING APPARATUS FOR DRY-CLEANING SYSTEMS

James D. Smith, 5741 Mission Blvd., Space 33, Riverside, Calif. 92504, and Richard Paul, 5400 Montgomery St., Riverside, Calif. 92503

Filed Jun. 2, 1980, Ser. No. 155,419
Int. Cl.[3] B01D *35/02, 35/18*
U.S. Cl. 210—167 **4 Claims**



1. A filter-and-cooling apparatus for liquid solvents used in a dry-cleaning process for clothes and other articles, said apparatus having a substantially closed solvent-flow system and a substantially closed water-cooling system, wherein the apparatus comprises:

a first housing having closed ends, and including an inlet port and an outlet port;

a cooling chamber adapted to receive a continuous flow of water therethrough, said chamber defining a water jacket;

a second housing positioned within said first housing and having a closed end and an open end, a filter chamber being defined therein and adapted to receive a continuous flow of solvent therethrough, said water jacket being formed about said filter chamber;

a second inlet port mounted in said closed end of said second housing;

an elongated nozzle connected to said inlet port of said first housing, whereby incoming cooling water is discharged throughout said cooling chamber, and wherein said inlet and outlet ports of said first housing are connected within said closed water-cooling system;

means for closing and sealing off said open end of said filter chamber;

means for filtering said solvent, said means being positioned within said sealed filter chamber;

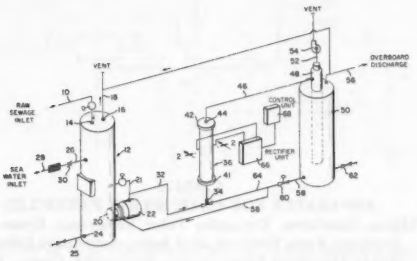
a discharge means mounted in said sealed filter chamber and adapted to support said filter means therein, wherein said discharged means and said support for said filter comprise an elongated pipe member centrally positioned within said sealed filter chamber, said pipe including a plurality of holes therein to receive said filtered solvent after passing through said filter means.

4,292,175

COMPACT ELECTROCATALYTIC SEWAGE TREATMENT UNIT FOR MARITIME USE

William A. Krause, and Leonard E. Langeland, both of Houston, Tex., assignors to Omnipure, Inc., Houston, Tex.

Filed Aug. 3, 1979, Ser. No. 63,581
Int. Cl.[3] C02F *1/46, 1/76*
U.S. Cl. 210—192 **6 Claims**



1. A compact unit for treatment of waste water which uses no chemical additives and which yields a discharge effluent low in suspended solids and essentially free of pathogenic organisms, comprising:

an elongated electrocatalytic cell having an inlet and outlet containing, between the inlet and outlet, closely spaced, vertically oriented electrodes positioned parallel to one another and parallel to the flow of waste water therethrough, the electrocatalytic cell positioned for flow of waste water to be treated upwardly from the inlet thereof to the outlet,

a closed surge vessel for gravity separation of heavy solids from the waste water to be treated and for evening out the flow of waste water to be treated to the electrocatalytic cell, having an inlet opening to receive the waste water to be treated, a vent opening connected to a vent line, and a discharge outlet,

a macerator means connected to the discharge outlet of the surge vessel for receiving waste water to be treated from the surge vessel and macerating the solids contained therein and delivering the waste water to be treated containing the macerated solids to the inlet of the electrocatalytic cell,

means for adding a sufficient amount of electrolyte to the waste water to be treated before entry thereof into the electrocatalyic cell for effective operation of the cell,

means connected to the surge vessel for injecting water thereinto in amounts sufficient to maintain a relatively constant minimum flow of water to be treated through the electrocatalytic cell at all times so as to allow continuous operation of the electrocatalyic cell during times when no waste water to be treated is entering the surge vessel,

a closed effluent vessel having a stand pipe therein connected to the discharge outlet of the electrocatalytic cell, the stand pipe including a vent opening therein for venting of entrained gases in the treated waste water,

means to create a negative pressure in the stand pipe, and

power means connected to the electrodes of the electrocatalytic cell for delivering direct current to the electrode plates within the cell, the power means charging the spaced electrode plates with an electrolyzing current for generation of chlorine, oxygen, and other disinfecting chemicals in situ.

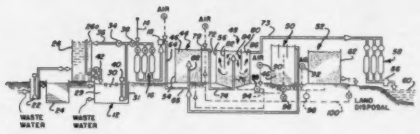
4,292,176
USE OF ACTIVATED CARBON IN WASTE WATER TREATING PROCESS

James F. Grutsch, Hammond, and Russell C. Mallatt, Crown Point, both of Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 748,553, Dec. 8, 1976, abandoned. This application Aug. 14, 1980, Ser. No. 178,139

Int. Cl.³ C02F *3/08*

U.S. Cl. 210—616 65 Claims



1. In the activated sludge process wherein a first stage contaminated water is contacted with activated sludge for a period of time sufficient to biologically degrade contaminants in the water and in a second stage decontaminated water is separated from the activated sludge, a first portion of said separated sludge being recycled for recontact with the water in the first stage and a second portion of said separated sludge being treated in downstream operations, the improvement comprising pretreating the contaminated water entering the first stage so that the water contains less than about 20 ppm of hydrocarbons and less than about 20 ppm of solids;

introducing 1 to 40 ppm based on feed waste water of activated carbon having a zeta potential of at least about −10 millivolts into the water so that the carbon is present in the first and/or second stage; and

maintaining the average age of the activated sludge in the first and second stages in excess of ten days.

63. In the activated sludge process wherein a first stage contaminated water is contacted with activated sludge for a period of time sufficient to biologically degrade contaminants in the water and in a second stage decontaminated water is separated from the activated sludge, a portion of said separated sludge being recycled for recontact with water in the first stage, the improvement comprising

pretreating the waste water prior to the first stage to reduce the chemical oxygen demand of the waste water by fifty percent;

operating the first or second stages in the presence of activated carbon by the addition of 1–40 ppm activated carbon based on feed waste water; and

maintaining the average sludge age in excess of 10 days.

4,292,177
PRESSURIZABLE ROTARY FILTER

Werner Stahl, Landau; Uwe Breuer, Gröbenzell; Bernhard Richter, Puchheim; Franz Alstetter; Franz Krappmann, both of Munich, and Hans Schuster, Lohhof, all of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 14, 1979, Ser. No. 94,063

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849528

Int. Cl.³ B01D *33/28*

U.S. Cl. 210—325 17 Claims

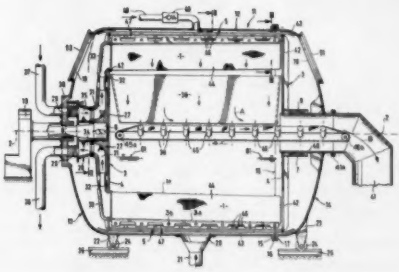
1. A rotary filter for the continuous filtration of a suspension to produce a filter cake and a filtrate, said rotary filter comprising:

a vessel adapted to receive said suspension;

a rotor mounted for rotation in said vessel and having a generally horizontal axis, said rotor being formed at one axial end with a distribution head connected to a source of elevated pressure and a source of reduced pressure and provided with respective conduits successively connected to said sources by said head upon rotation of said rotor, said rotor being further provided with cell-mounting elements along its outer periphery;

a plurality of angularly spaced filter cells suspended from said elements and extending inwardly to terminate at a distance from said axis while communicating with said conduits whereby filtrate is withdrawn from said cells to deposit said cake thereon as said cells are immersed in said suspension and said cake is dislodged from said cells by fluid pressure therein at a location in the path of said cells about said axis; and

means in said vessel disposed at least in part in a space within an orbit of inner edges of said cells for withdrawing dislodged filter cake from said vessel, said vessel comprising a first dome at said end of said rotor forming a rotatable support for said rotor and said head, a cylindrical member fixed to said first dome and surrounding said rotor, and a second dome detachably connected to said cylindrical member, said means in said vessel for withdrawing said filter cake including a conveyor discharging said cake through said second dome, said domes being provided with closable access windows alignable with said filter cells for the removal and replacement of said filter cells on said rotor, said rotor comprising a pair of end plates with openings corresponding to said filter cells and alignable with said windows, said elements being rails extending axially between said end plates, and said filter cells being operatively connected with brackets slidably engaging said rails for the axial displacement of said filter cells along



said rails, said first dome and said cylindrical member forming one part said second dome forming another part of a pressurizable enclosure constituted by said vessel, one of said parts being separable from the other, said vessel being formed with means for pressurizing the interior thereof.

14. A rotary filter for the continuous filtration of a suspension to produce a filter cake and a filtrate, said rotary filter comprising:

a vessel adapted to receive said suspension;

a rotor mounted for rotation in said vessel and having a generally horizontal axis, said rotor being formed at one axial end with a distribution head connected to a source of elevated pressure and a source of reduced pressure and provided with respective conduits successively connected to said sources by said head upon rotation of said rotor, said rotor being further provided with cell-mounting elements along its outer periphery;

a plurality of angularly spaced filter cells suspended from said elements and extending inwardly to terminate at a distance from said axis while communicating with said conduits whereby filtrate is withdrawn from said cells to deposit said cake thereon as said cells are immersed in said suspension and said cake is dislodged from said cells by fluid pressure therein at a location in the path of said cells about said axis; and

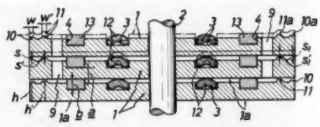
means in said vessel disposed at least in part in a space within an orbit of inner edges of said cells for withdrawing dis-

lodged filter cake from said vessel, said vessel comprising a first dome at said end of said rotor forming a rotatable support for said rotor and said head, a cylindrical member fixed to said first dome and surrounding said rotor, and a second dome detachably connected to said cylindrical member, means in said vessel for withdrawing said filter cake including a conveyor discharging said cake through said second dome, said domes being provided with closable access windows alignable with said filter cells for the removal and replacement of said filter cells on said rotor, said rotor comprising a pair of end plates with openings corresponding to said filter cells and alignable with said windows, said elements being rails extending axially between said end plates, and said filter cells being operatively connected with brackets slidably engaging said rails for the axial displacement of said filter cells along said rails, said first dome and said cylindrical member forming one part and said second dome forming another part of said vessel, one of said parts being separable from the other.

4,292,178
FILTERING APPARATUS

Takehiko Mori, and Kazuo Mori, both of No. 3-23-8, Okusawa, Setagaya-Ku, Tokyo, Japan

Filed Aug. 2, 1979, Ser. No. 62,935
Int. Cl.[3] B01D *29/38, 25/34*
U.S. Cl. 210—352 **3 Claims**



3. A filtering apparatus comprising:

at least first and second discs stacked with a first surface of said first disc facing a first surface of said second disc;

at least one annular projection of said first surface of said first disc;

means for maintaining said at least one annular projection a uniform predetermined fixed distance from said first surface of said second disc whereby at least one filtering slit having a uniform predetermined fixed width is formed therebetween;

passage means for fluid communication with a location between said first and second discs radially inward of said at least one filtering slit;

said clamping means includes a piston and a cylinder, said pistion and cylinder being further operative to permit said first and second discs to move apart under urging of said resilient member for back flushing; and

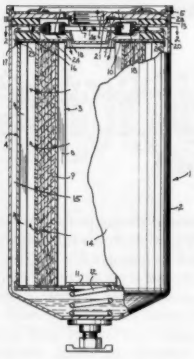
said clamping means is operative to at least partially release it urging of said first and second discs and said at least one resilient member is operative to move said first and second discs apart whereby the width of said filtering slit is increased to permit back flushing of particles from said filtering apparatus.

4,292,179
SPIN-ON FILTER COALESCER UNIT WITH FLOW REVERSING BAFFLE ASSEMBLY

Walter H. Stone, Madison, Wis., and William G. Nostrand, Snelling, Calif., assignors to Nelson Industries, Inc., Stoughton, Wis.

Filed May 21, 1980, Ser. No. 151,946
Int. Cl.[3] B01D *33/38, 27/00*
U.S. Cl. 210—443 **10 Claims**

1. A flow reversing device for a spin-on liquid separator unit having a cylindrical container having an open end, an annular separating element disposed within the container and defining an axial passage and an outer circumferential passage, a first baffle member disposed adjacent the open end and having a centrally located outlet opening; a second baffle member spaced inwardly from said first baffle member to define a chamber between said baffle members, said chamber connecting the circumferential passage to the outlet opening, and

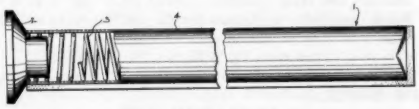


conduit means connecting said first and second baffle members and extending across said chamber, whereby liquid entering said conduit means flows into the axial passage of the separating element, said liquid then flowing radially outward through the separating element and longitudinally in the circumferential passage to said chamber for discharge through the outlet opening.

4,292,180
MILK FILTER SOCK

Kenneth R. Zylka, Grafton, and Earl R. Witte, Richfield, both of Wis., assignors to Meridian Industries Inc., Milwaukee, Wis.

Filed Mar. 31, 1980, Ser. No. 135,226
Int. Cl.[3] B01D *29/30*
U.S. Cl. 210—496 **2 Claims**



1. An open-ended filter sock for filtering milk, comprising a longitudinally folded sheet of randomly oriented spun bonded synthetic fibers, said sheet having a pair of overlying sheet sections and having a weight in the range of 1.5 to 4.0 ounces per square yard, a first ultrasonic weld joining the adjacent longitudinal edges of the sheet sections, and a second ultrasonic weld joining a pair of adjacent end edges of said sheet sections to provide a tubular open-ended sock, said ultrasonic welds comprising a series of alternating depressions and projections to thereby increase the strength of the welded area.

4,292,181

USE OF LIQUID MEMBRANE SYSTEMS FOR SELECTIVE ION TRANSFER

Norman N. Li, Edison; Robert P. Cahn, Millburn, and Adam L. Shrier, Montclair, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 955,957, Oct. 30, 1978, abandoned, which is a continuation of Ser. No. 699,707, Mar. 23, 1976, abandoned, and a continuation-in-part of Ser. No. 404,716, Oct. 9, 1973, abandoned, which is a division of Ser. No. 174,990, Aug. 25, 1971, Pat. No. 3,779,907, which is a continuation-in-part of Ser. No. 28,094, Feb. 13, 1970, Pat. No. 3,617,546, and a continuation-in-part of Ser. No. 36,686, May 5, 1970, Pat. No. 3,637,488. This application Jun. 20, 1980, Ser. No. 161,602

Int. Cl.³ B01D *13/00;* C02F *1/28*

U.S. Cl. 210—638 18 Claims

1. In a liquid membrane process for removing ions from solution which comprises contacting a feed solution containing a first ion with an emulsion, said emulsion comprising an internal phase and an external phase which is immiscible with both said feed solution and internal phase, said external phase containing a complexing agent dissolved therein which forms an external phase-soluble first complex with said first ion whereby said first ion diffuses through the external phase to the internal phase, the improvement which comprises said internal phase containing a second ion therein at a concentration greater than in the feed solution which converts said first complex to a second complex with the second ion, thereby simultaneously releasing said first ion into said internal phase in a form which remains present therein in a form chemically identical to that in which it exists in the feed solution said second complex also being soluble in said external phase, whereby said second ion diffuses from said internal phase into said feed solution, said contacting occurring for a time sufficient for at least a portion of said first ion to be removed from said feed solution.

14. A process for removing cupric ion from an aqueous feed solution containing same which comprises contacting said feed solution with an emulsion having an internal aqueous phase containing hydrogen ions and an external oily phase containing a hydroxyoxime ion-exchange compound, said external phase being immiscible with both said feed solution and said internal phase, and wherein said ion exchange compound forms a complex with cupric ion at a pH of greater than about 1 to from a complex of said cupric ion and said ion-exchange compound at the interface of the feed solution and external phase to diffuse said cupric ion through the external phase to the internal phase of the emulsion wherein said cupric ion is released as cupric ion and wherein hydrogen ion in the internal phase replaces the cupric ion of the complex to form a hydrogen ion complex with the ion-exchange compound which then permits the hydrogen ion to diffuse back to the interface of the external phase and feed solution to release hydrogen ion into said feed solution and reform the cupric ion complex with the ion exchange compound, said contacting of the feed solution and emulsion being carried out while the pH of the feed solution is greater than about 1 and the pH of the internal phase is less than about 1.

4,292,182

IMPARTING ANTI-SOILING PROPERTIES TO FIBERS

Alex K. Jahn, Williamsburg, Va., assignor to Badische Corporation, Williamsburg, Va.

Continuation-in-part of Ser. No. 955,847, Oct. 30, 1978, abandoned. This application Oct. 14, 1980, Ser. No. 196,424

Int. Cl.³ D06M *13/16, 13/32*

U.S. Cl. 252—8.6 5 Claims

1. A process for imparting anti-soiling properties to fibers, which process comprises applying to the fibers an effective amount of the neutralized phosphate ester of an aliphatic alcohol having from 12 to 22 carbon atoms in the chain, the ester having been prepared by reacting about 3 moles of alochol with one mole of phosphoric pentoxide.

4,292,183

HIGH-DENSITY FLUID COMPOSITIONS

David C. Sanders, West Lafayette, Ind., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Dec. 13, 1978, Ser. No. 969,236

Int. Cl.³ E21B *43/00;* C09K *3/00*

U.S. Cl. 252—8.55 R 12 Claims

1. A clear, high-density fluid adapted for use as a well completion, packing, and perforation medium consisting of a solution of zinc bromide and calcium bromide in water having a density lying in the range of about 14.5 up to about 18.0 pounds per gallon and a measured pH lying in the range of about 3.5 up to about 6.0;

10. In a method of completion or workover of wells wherein a high-density fluid is injected into the well to exert sufficient hydrostatic pressure to control the well, the improvement comprising employing as the high-density fluid a clear solution comprising zinc bromide and calcium bromide in water having a density lying in the range of about 14.5 up to about 18.0 pounds per gallon and a measured pH lying in the range of about 3.5 up to about 6.0.

4,292,184

THIO-BIS-(HYDROCARBON-BISOXAZOLINES) AS OLEAGINOUS ADDITIVES FOR LUBRICANTS AND FUELS

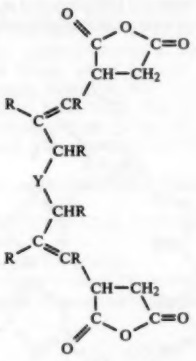
Stanley J. Brois, Spring, Tex., and Antonio Gutierrez, Mercerville, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 23,615, Mar. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 817,217, Jul. 20, 1977, Pat. No. 4,174,322, which is a division of Ser. No. 726,206, Sep. 24, 1976, Pat. No. 4,062,786. This application Mar. 27, 1980, Ser. No. 134,511

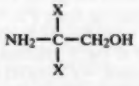
Int. Cl.³ C10M *1/38;* C10L *1/24;* C07D *263/14*

U.S. Cl. 252—46.3 16 Claims

1. A process comprising the step of reacting one molar proportion of an acylating reagent of the formula



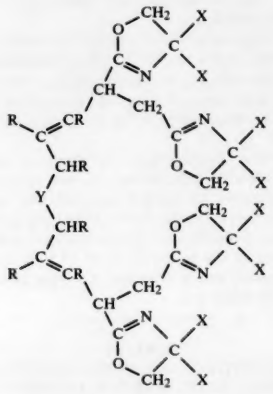
where Y is sulfur or selenium and R is hydrogen or an alkyl radical containing from 1 to 400 carbons, with from 1 to 4 molar proportions of a 2,2-disubstituted-2-amino-1-alkanol containing a total of 4 to 8 carbon atoms represented by the formula:



wherein X is an alkyl or hydroxyalkyl group, with at least one of the X substituents being a hydroxy alkyl group of the struc-

ture—$(CH_2)_nOH$, wherein n is 1 to 3, until the reaction product shows maximal absorption for oxazoline as measured by infrared analysis.

9. A compound represented by the formula:

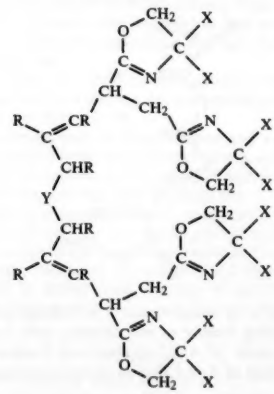


wherein R is selected from the group consisting of hydrogen and alkyl radicals containing from 1 to 400 carbons, X is selected from the group consisting of an alkyl or hydroxy alkyl group and at least one of the X substituents being a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3, and Y is selected from the group consisting of —S—, —S—S—, >S=O, $>SO_2$, —Se— and —S—$(CH_2)_z$—S— wherein z is a number from 2 to 10.

11. Dithio-bis-[polyisobutenyl-bis-(5,5,-bis-methylol-2-oxazoline)].

12. Thio-bis-[polyisobutenyl-bis-(5,5,-bis-methylol-2-oxazoline)].

13. A composition comprising an oleaginous material of the class consisting of fuels and lubricants and at least a corrosion-inhibiting amount of a compound represented by the formula:



wherein R is selected from the group consisting of hydrogen and alkyl radicals containing from 1 to 400 carbons, X is selected from the group consisting of an alkyl or hydroxy alkyl group and at least one of the X substituents being a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3, and Y is selected from the group consisting of —S—, —S—S—, >S=O, $>SO_2$, —Se— and —S—$(CH_2)_z$—S— wherein z is a number from 2 to 10.

4,292,185

POLYMERIC ADDITIVE FOR LUBRICANTS AND FUELS

Joseph M. Bollinger, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 31, 1979, Ser. No. 108,443

Int. Cl.³ C10M *1/38*

U.S. Cl. 252—47.5 **17 Claims**

1. A polymeric additive for lubricating oils and hydrocarbon fuels, comprising an oil-soluble, viscosity index improving, non-conjugated diene-modified mono-olefinic backbone polymer containing about 1-10 mole % diene unsaturation, said backbone polymer being functionalized with chlorosulfonyl isocyanate and post-reacted with a nitrogen compound effective for imparting dispersant activity to said backbone polymer, said nitrogen compound being an amine having at least one primary or secondary amino group.

8. A composition comprising a major amount of a lubricating oil and a minor detergent amount of a polymeric additive comprising an oil-soluble, viscosity index improving, non-conjugated diene-modified mono-olefinic backbone polymer containing about 1-10% diene unsaturation, said backbone polymer being functionalized with chlorosulfonyl isocyanate and post-reacted with a nitrogen compound effective for imparting dispersant acitivity to said backbone polymer, said nitrogen compound being an amine having at least one primary or secondary amino group.

15. A method for preparing a polymeric additive, comprising reacting an oil-soluble, viscosity index improving, non-conjugated diene-modified mono-olefinic backbone polymer containing about 1-10 mole % diene unsaturation with chlorosulfonyl isocyanate, and post-reacting the resulting functionalized backbone polymer with a nitrogen compound effective for imparting dispersant activity to the backbone polymer, said nitrogen compound being an amine having at least one primary or secondary amino group.

4,292,186

METAL COMPLEXES OF ALKYLSUCCINIC COMPOUNDS AS LUBRICANT AND FUEL ADDITIVES

Sheldon Chibnik, Cherry Hill, N.J.; Ferdinand P. Otto, deceased, late of Sun City Center, Fla., and Helen F. Otto, executrix, Fort Lauderdale, Fla., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 100,087, Dec. 4, 1979, abandoned, which is a continuation of Ser. No. 941,835, Sep. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 922,953, Jul. 10, 1978, abandoned, which is a continuation of Ser. No. 727,197, Sep. 27, 1976, abandoned. This application Jul. 3, 1980, Ser. No. 165,875

Int. Cl.³ C10M *1/10*; C10L *1/14*

U.S. Cl. 252—49.7 **28 Claims**

1. A metal complex prepared by (1) forming a non-acidic product of reaction between 1 mole proportion of a polyalkenylsuccinic acid or anhydride and from about 1 to about 2 mole proportions of a polyhydric alcohol or aminoalcohol of the formula

$$A—(CR_2)_q—CH_2OH$$

wherein R is hydrogen, a C_1-C_{15} alkyl, hydroxyl, amino or $—CH_2OH$, A is NH_2 or $—CH_2OH$ and q is 1 to 2, wherein at least one R group is hydroxyl, amino or $—CH_2OH$, the remaining R groups being hydrogen, hydroxyl, C_1-C_{15} alkyl, $—CH_2OH$ or amino, the reaction being carried out at from about 25° C. to about 275° C., and (2) reacting said product at from about 25° C. to about 200° C. with a metal salt, the metal being selected from Groups IB, IIB, IVB, VB, VIB and VIII of the Periodic Table, the amount of salt used being at least equivalent to two of the —OH or —A functions or combinations thereof.

14. A lubricant or fuel composition comprising a major proportion of a lubricating oil, a grease thereof or a liquid

hydrocarbon fuel and a detergent amount of a metal complex as defined in claim **1**.

4,292,187

LUBRICATING OILS FOR THE WORKING OF METALS

Karl-Heinz Hentschel; Rolf Dhein, both of Krefeld, and Wolfgang Schüle, Ketsch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,741

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909517

Int. Cl.[3] **C10M** *1/24, 1/06;* **C09F** *5/08;* **C07C** *69/66*

U.S. Cl. 252—49.5 **7 Claims**

1. A condensation product produced from

(A) from 5 to 25% by weight of at least one aliphatic or cycloaliphatic polyol containing from 2 to 60 carbon atoms and from 2 to 8 alcoholic hydroxyl groups per molecule,

(B) from 5 to 40% by weight of at least one aliphatic saturated or once unsaturated C_6–C_{22}-hydroxycarboxylic acid or a lactone thereof and/or an oligomeric condensation product thereof with an average degree of oligomerisation of from 2 to 50 and an average molecular weight of from 210 to 12,000, and

(C) from 35 to 90% by weight of at least one saturated or unsaturated, straight-chained or slightly branched, aliphatic or cycloaliphatic C_6–C_{24}-monocarboxylic acid,

wherein the sum of the components (A) to (C) is 100% by weight and the condensation product has

(1) an acid number of from 0.01 to 30 mg KOH/g,

(2) a hydroxyl number of from 0.01 to 60 mg KOH/g, and

(3) an iodine number of from 30 to 100.

6. A lubricant for the working of metal, comprising a condensation product according to any one of claims **1** to **5** alone or in a mixture with at least one other lubricating oil, and optionally with at least one conventional additive.

4,292,188

NON-ABRASIVE BAUXITE-BASED FIRE RETARDANT

Joseph P. Barone; Sergio A. Loynaz, both of Baltimore, and Frederick W. Bauer, Bethesda, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jun. 1, 1979, Ser. No. 44,630

Int. Cl.[3] **C09K** *3/28*

U.S. Cl. 252—62 **18 Claims**

1. A fire retardant composition comprising from about 60 to about 85% by weight bauxite, from about 5 to about 30% boric acid, and from about 5 to about 30% dolomite.

4,292,189

THERMAL ENERGY STORAGE COMPOSITION COMPRISING SODIUM SULFATE DECAHYDRATE; SODIUM CARBONATE DECAHYDRATE; AND SODIUM TETRABORATE DECAHYDRATE

Johnson C. Chen, Philadelphia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 30, 1979, Ser. No. 61,590

Int. Cl.[3] **C09K** *5/06*

U.S. Cl. 252—70 **3 Claims**

1. A composition for storing and releasing thermal energy consisting essentially of the following ingredients expressed in percent by weight:

sodium sulfate decahydrate—about 30–50%,

sodium carbonate decahydrate—about 50–60%,

sodium borate decahydrate—about 1–10% and

a thickening agent—about 0.5 to 8%,

wherein the composition melts and freezes within the range of 21° to 24° centrigrade.

4,292,190

CORROSION INHIBITED AQUEOUS COMPOSITIONS CONTAINING TERTIARY, BICYCLIC, OR TRICYCLIC AMINES

Pauls Davis, Gibraltar; Jerrold F. Maxwell, and Joe C. Wilson, both of Woodhaven, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 89,620, Oct. 29, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 142,482

Int. Cl.[3] **C11D** *7/32;* **C09K** *5/00*

U.S. Cl. 252—75 **16 Claims**

1. A corrosion inhibited aqueous alkaline alcohol solution for use in contact with metals below sodium in the electromotive displacement series comprising an effective metal corrosion inhibiting amount of at least one tertiary, cyclic, bridgehead amine.

4,292,191

ACTIVATED PEROXY COMPOUND BLEACHING COMPOSITIONS AND BLEACHING DETERGENT COMPOSITIONS

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 629,117, Nov. 5, 1975, Pat. No. 4,107,065. This application Jul. 31, 1978, Ser. No. 929,845

Int. Cl.[3] **C11D** *7/54*

U.S. Cl. 252—99 **19 Claims**

8. An activated peroxy compound particulate solid bleaching composition consisting essentially of a peroxy bleaching compound selected from the group consisting of alkali metal perborates and alkali metal percarbonates and mixtures thereof and an activator for such peroxy bleaching compound which is an alkoxybenzenesulfonyl halide wherein the alkoxy is of 1 to 20 carbon atoms and the halogen of the halide is selected from the group consisting of chlorine and bromine and wherein the weight ratio of active oxygen of the peroxy bleaching compound to the activator is in the range of 1:20 to 1:1.

4,292,192

PERSONAL WASHING DETERGENT BARS WITH AN EFFECTIVE AMOUNT OF A CITRIC ACID ESTER

David C. Hooper, Ashford; George A. Johnson, and Donald Peter, both of Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 877,534, Feb. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 826,079, Aug. 19, 1977, abandoned. This application Jun. 13, 1980, Ser. No. 159,320

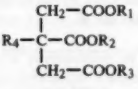
Claims priority, application United Kingdom, Aug. 20, 1976, 34788/76

Int. Cl.[3] **C11D** *17/00, 9/26;* **A61K** *7/32*

U.S. Cl. 252—132 **6 Claims**

1. A detergent bar comprising:

(i) from about 0.3% to about 3% by weight of an optionally acetylated ester of citric acid of formula



wherein R_1 R_2 and R_3 are hydrogen or an alkyl group containing from 1 to 4 carbon atoms, provided at least one of R_1 R_2 and R_3 is an alkyl group, and R_4 is a hydroxyl or a CH_3COO— group;

(ii) a water content of from about 5% and;

(iii) up to about 94.7% of detergent active material and other components of detergent bars.

6. A detergent bar according to claim **1** wherein the detergent active material includes water soluble salts of long chain (C_8 to C_{24}) aliphatic acids.

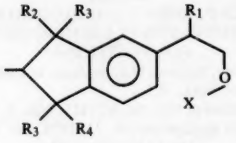
4,292,193

ISOCHROMAN MUSK COMPOUNDS AND ORGANOLEPTIC USES THEREOF

Wilhelmus J. Wiegers, Red Bank; Mark A. Sprecker, Sea Bright; Hugh Watkins, Lincroft; Manfred H. Vock, Locust, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 63,374, Aug. 3, 1979, Pat. No. 4,250,200.
This application Nov. 13, 1980, Ser. No. 206,650
Int. Cl.³ C11D *9/44, 3/50*
U.S. Cl. 252—174.11 **1 Claim**

1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic or nonionic detergent comprising the step of intimately admixing with a solid or liquid anionic, cationic or nonionic detergent base an aroma augmenting or enhancing quantity of at least one indane alkanol or tricyclic isochroman having the structure:



wherein X is hydrogen, methyl or $—CH_2—$; the dashed line is either a carbon-carbon single bond or no bond; R_1 is hydrogen or methyl; R_2, R_3, R_4 and R_5 represent hydrogen, methyl or isopropyl; with the proviso that R_2 and R_3 are methyl when R_4 is hydrogen and R_5 is isopropyl or R_4 and R_5 represent methyl when R_2 is hydrogen and R_3 is isopropyl; and with the further proviso that the dashed line is a carbon-carbon single bond when X is $—CH_2—$ and the dashed line is no bond when X is hydrogen or CH_3.

4,292,194

LIQUID COMPOSITION FOR LIGHT AND HEAT STABILIZATION OF POLYAMIDES

Pierluigi Perazzoni, Palazzolo, and Luigi Bilancini, Cesano Maderno, both of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Jun. 15, 1979, Ser. No. 48,985
Claims priority, application Italy, Jun. 15, 1978, 24585 A/78
Int. Cl.³ C09K *15/02, 15/06*
U.S. Cl. 252—400 R **13 Claims**

1. A clear, aqueous liquid adapted to increase the light and heat stability of polyamides, which comprises: water, at least one univalent copper salt bound to at least one halogen atom and to at least one organic compound (B) miscible with or soluble in water and capable of decreasing the precipitating ability of the univalent copper salt in water, the molar ratio $\Sigma X/Cu^+$ wherein ΣX represents the sum of the halogens being less than 8 and the amount of compound (B) being sufficient to maintain the compound CuX or its complexes in solution at temperatures lower than 60° C.

4,292,195

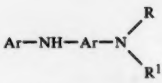
NON-FUGITIVE ANTIOXIDANTS

Roger E. Morris, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 16, 1977, Ser. No. 796,900
Int. Cl.³ C09K *15/16*
U.S. Cl. 252—401 **36 Claims**

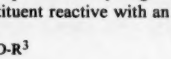
1. A composition useful as an antioxidant which comprises the reaction product of a mixture of

(a) at least one compound selected from compounds having the formula



(I)

wherein each Ar is an aromatic group, and R and R^1 are each independently hydrogen, alkyl, substituted alkyl, oxyalkylene or $—C(O)—R^2—COOH$ groups wherein R^2 is an alkylene or alkenylene group, with the proviso that at least one of the R and R^1 groups must be hydrogen or a group containing at least one substituent reactive with an epoxy group, and



(II)

wherein Ar is as defined above and R^3 is hydrogen, or a substituted alkyl group containing at least one substituent reactive with an epoxy group, or $—C(O)—R^2—COOH$ wherein R^2 is an alkylene or alkenylene group, and

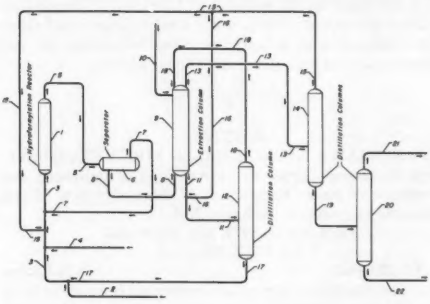
(b) at least one polyepoxide having at least 2 epoxy groups per molecule.

4,292,196

CATALYST RECOVERY

Edwin H. Homeier, Maywood; Alan R. Dodds, Elgin, and Tamotsu Imai, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 10, 1979, Ser. No. 101,949
Int. Cl.³ B01J *31/40;* **C07C** *29/16, 45/50, 29/86*
U.S. Cl. 252—412 **8 Claims**



1. A process for the extraction of a Group VIII metal catalyst contained in the products of a hydroformylation reaction of an olefin, carbon monoxide and hydrogen in the presence of said catalyst, the catalyst being in the form of a metal carbonyl or organometallic complex in homogeneous admixture with said reaction products, which process comprises treating the catalyst-containing reaction products, at a temperature of from about ambient to about 100° C. and a pressure of from about 0 to about 1000 psig., with the addition of an aqueous solution of a water-soluble nitrogen-containing compound selected from the group consisting essentially of ammonia, ammonium hydroxide and amines capable of acting as a complexing agent at said temperature and pressure, wherein said added nitrogen-containing compound complexes with said catalyst and recovering a separated aqueous phase containing the extracted resultant metal-containing complex.

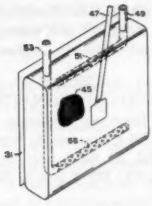
7. The process as set forth in claim **1** in which the metal portion of said metal carbonyl or organometallic complex is rhodium.

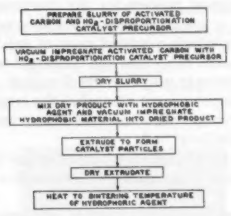
8. The process as set forth in claim **1** in which said metal carbonyl or organometallic complex is modified by the presence of an amine.

4,292,197
METHOD OF PREPARING ELECTROCATALYST FOR AN OXYGEN DEPOLARIZED CATHODE ELECTROLYTIC CELL

Ronald D. Chamberlin, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 9, 1979, Ser. No. 82,842
Int. Cl.³ B01J 23/50, 21/18; C25B 11/14, 11/02
U.S. Cl. 252—425.3 6 Claims




PREPARE SLURRY OF ACTIVATED CARBON AND HO_2^- - DISPROPORTIONATION CATALYST PRECURSOR
VACUUM IMPREGNATE ACTIVATED CARBON WITH HO_2^- - DISPROPORTIONATION CATALYST PRECURSOR
DRY SLURRY
MIX DRY PRODUCT WITH HYDROPHOBIC AGENT AND VACUUM IMPREGNATE HYDROPHOBIC MATERIAL INTO DRIED PRODUCT
EXTRUDE TO FORM CATALYST PARTICLES
DRY EXTRUDATE
HEAT TO SINTERING TEMPERATURE OF HYDROPHOBIC AGENT

1. A method of preparing electroconductive, catalytic particles comprising the steps of:
(a) forming a slurry of activated carbon and a thermally decomposable silver compound;
(b) impregnating the activated carbon with the thermally decomposable silver compound;
(c) drying the slurry whereby to form dried carbon product;
(d) thereafter mixing the dried carbon product with a dispersion of a hydrophobic compound to form a second slurry;
(e) impregnating the hydrophobic compound into the carbon product;
(f) forming the second slurry into particles; and
(g) thereafter heating the particles formed from the second slurry whereby to dry the particles, sinter the hydrophobic compound, and form electroconductive, catalytic, sintered particles having silver HO_2^- disproportionation catalyst impregnated carbon and hydrophobic material.

4. The method of claim 1 comprising vacuum impregnating the activated carbon with the thermally decomposable silver compound.

5. The method of claim 1 comprising heating the dried carbon to form HO_2^- disproportionation catalyst.

4,292,198
HETEROGENEOUS CATALYST ON THE BASIS OF AN ORGANOMETALLIC COMPLEX

Leendert A. Gerritsen, Hendrik Ido Ambacht, and Joseph J. F. Scholten, Sittard, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 14, 1980, Ser. No. 139,662
Claims priority, application Netherlands, Apr. 14, 1979, 7902964
Int. Cl.³ B01J 31/06, 31/20
U.S. Cl. 252—428 9 Claims

1. In a catalyst composition composed of a solid porous particulate carrier material impregnated with a solution of a catalytically active organometallic complex in an excess amount of ligand-forming compound, the improvement consisting essentially in said carrier having an organophilic surface which is completely or virtually free of alkali metal ions and acid or basic groups which would be reactive with the said organometallic complex.

4,292,199
METHOD OF PREPARING A SUPPORT MATRIX

Ronald P. Rohrbach, Forest Lake, and Mary J. Maliarik, Lake Forest, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 18, 1980, Ser. No. 178,659
Int. Cl.³ B01J 31/06; C12N 11/08
U.S. Cl. 252—430 9 Claims

1. In a method of preparing a support matrix including impregnating a porous, refractory inorganic oxide with a polyamine, contacting the impregnated oxide with an excess of a bifunctional reagent so as to cross-link the polyamine and furnish a plurality of pendant functional groups, removing unreacted but adhering bifunctional reagent, and recovering the suport matrix, the improvement comprising: impregnating the oxide with a polyamine at a pH less than about 4 and thereafter curing the impregnated oxide at a pH from about 8 to 12.

4,292,200
CATALYST COMPOSITION FOR POLYMERIZATION OF OLEFINS

Eugene Berger, and Jean-Louis Derroitte, both of Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Division of Ser. No. 312,744, Dec. 6, 1972, Pat. No. 3,901,863.
This application Mar. 12, 1975, Ser. No. 557,643
Claims priority, application Luxembourg, Dec. 8, 1971, 64420
Int. Cl.³ C08F 1/42
U.S. Cl. 252—431 C 17 Claims

1. A catalyst composition for the low pressure polymerization and copolymerization of α-olefins consisting essentially of
(A) the solid reaction product of (1) at least one non-halide containing organic oxygenated compound of magnesium with at least one non-halide containing organic oxygenated transition compound of a transition metal selected from the metals of Groups IVa, Va, and VIa of the Periodic Table in which the organic radical is attached to the transition metal via oxygen, and with an organo aluminum halide having the general formula $AlR_nR'_{3-n}$ in which R is a hydrocarbon radical containing 1 to 20 carbon atoms, R' is a halide and n is any number such that $1 \leqq n \leqq 2$; and
(B) an organo-metallic compound selected from the organic derivatives of metals of Groups Ia, IIa, IIb, IIIb, and IVb of the Periodic Table.

4,292,201
PREPARATION OF VANADIUM(IV)BIS(METAPHOSPHATE) HYDROCARBON OXIDATION CATALYST CONTAINING AN ACTINIDE OR LANTHANIDE SERIES METAL

James C. Vartuli, West Chester, Pa., and Lee R. Zehner, Dublin, Ohio, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 19, 1979, Ser. No. 105,364
Int. Cl.³ B01J 27/14, 31/02; C07D 307/60
U.S. Cl. 252—435 13 Claims

1. A method for the preparation of a cerium or thorium promoted single phase crystalline vanadium(IV)bis(metaphosphate) hydrocarbon oxidation catalyst which comprises the steps of:
forming a slurry of vanadyl sulfate, a compound selected from ceric oxide, cerous nitrate or thorium dioxide, acetic anhydride and phosphorus pentoxide with the liberation of heat;
introducing said slurry into a heating zone and maintaining said zone at a temperature of at least about 325° C. for a period sufficient for the liberation of gases and forming a cerium or thorium-vanadium-phosphorus reaction product;

cooling the reaction product and washing with water to essentially remove any soluble residue;

drying the water washed product and calcining in air to obtain a cerium or thorium containing single phase crystalline vanadium(IV)bis(metaphosphate) catalyst.

4,292,202

PREPARATION OF A VANADIUM(IV)BIS(METAPHOSPHATE) HYDROCARBON OXIDATION CATALYST CONTAINING A GROUP VIB METAL PROMOTER

James C. Vartuli, West Chester, Pa., and Lee R. Zehner, Dublin, Ohio, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 19, 1979, Ser. No. 105,366

Int. Cl.³ B01J *27/14, 31/02;* **C07D** *307/60*

U.S. Cl. 252—435 **17 Claims**

1. A method for the preparation of a promoted single phase crystalline vanadium(IV)bis(metaphosphate) hydrocarbon oxidation catalyst containing a Group VIB metal of the Periodic Table which comprises the steps of:

forming a slurry of vanadyl sulfate, a Group VIB metal oxide selected from chromic oxide, molybdenum oxide or tungstic oxide, acetic anhydride and phosphorus pentoxide with the liberation of heat;

introducing said slurry into a heating zone and maintaining said zone at a temperature of at least about 325° C. for a period sufficient for the liberation of gases and forming a Group VIB metal-vanadium-phosphorus reaction product;

cooling the reaction product and washing with water to essentially remove any soluble residue;

drying the water washed product and calcining in air to obtain a Group VIB metal containing single phase crystalline vanadium(IV)bis(metaphosphate) catalyst.

4,292,203

OXIDATION CATALYSTS

Ernest C. Milberger, Solon, and Eunice K. T. Wong, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 784,003, Apr. 4, 1977, Pat. No. 4,155,920, and a continuation-in-part of Ser. No. 901,888, May 1, 1978, Pat. No. 4,240,931. This application Mar. 17, 1980, Ser. No. 130,958

Int. Cl.³ B01J *27/24, 29/06, 23/10, 23/14*

U.S. Cl. 252—438 **12 Claims**

1. A catalyst composition of the formula

$$A_aE_cMo_eSb_fO_x$$

wherein

A is at least one element selected from the group consisting of tantalum and zirconium;

E is a member selected from the group consisting of molybdenum, tungsten, magnesium, aluminum or nickel;

and wherein

a is a number from 0.01 to 3;

c is a number from greater then 0 to 0.2;

e and f are numbers from 1 to 9;

x is a number which satisfies the valence requirements of the other elements present;

and wherein at least some of the molybdenum in the catalyst is maintained at a valence state below +6;

said catalyst optionally containing one or more elements selected from the group consisting of lithium, silver, cerium, cadmium, cobalt, arsenic, silicon, zinc, germanium, bismuth, ruthenium, platinum and uranium.

4,292,204

REFORMING WITH MULTIMETALLIC CATALYSTS

Charles H. Mauldin, and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1979, Ser. No. 53,376

Int. Cl.³ B01J *27/04, 27/08, 27/10, 23/64*

U.S. Cl. 252—439 **14 Claims**

1. A reforming catalyst which consists of from about 0.1 to about 2 percent palladium, from about 0.1 to about 2 percent rhenium, and from about 0.01 to about 0.2 percent iridium composited with an inorganic oxide support.

4,292,205

ION EXCHANGE AND IMPREGNATION OF CATALYSTS

Emmerson Bowes, Pilesgrove Township, Salem County, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 20, 1979, Ser. No. 59,349

Int. Cl.³ B01J *29/06, 29/28*

U.S. Cl. 252—455 Z **11 Claims**

1. An improved process for the continuous or batchwise impregnation or ion exchange of a catalyst or catalyst support of the type in which a settled mass of solid catalyst carrier particles is packed in a vessel and contacted with an upflowing stream of impregnating/ion exchanging liquid solution, wherein the improvement comprises the introduction of a gas stream cocurrently with said liquid stream under conditions to establish an ebullated bed.

2. The process of claim **1** wherein the gas is selected from a group consisting of air nitrogen, carbon dioxide and mixtures thereof.

8. A process for the preparation of a magnesium impregnated ZSM-5 catalyst which process comprises contacting a settled mass of solid particles of ZSM-5 alumina extrudate packed in a vessel with an upward flow of liquid magnesium acetate solution and a cocurrent upward flow of gas under conditions to transform said settled mass of solids into an ebullated bed.

4,292,206

USE OF HOLLOW GLASS SPHERES IN CONJUNCTION WITH REHYDRATABLE ALUMINA FOR MAKING LOW DENSITY CATALYST SUPPORT BEADS

Robert E. Barnes, Jr., Sandy Hook, and Venkatrao Pai, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 22, 1980, Ser. No. 180,559

Int. Cl.³ B01J *21/04, 35/08*

U.S. Cl. 252—463 **5 Claims**

1. Spherical alumina particles having macroporous structure prepared by forming a mixture of alumina powder and hollow glass spheres with water into wet spherical beads of said mixture, drying the beads and calcining the dried beads.

4,292,207

NONACIDIC SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE FOR USE IN HYDROCARBON DEHYDROGENATION

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 34,810, Apr. 30, 1979, Pat. No. 4,210,769, which is a continuation-in-part of Ser. No. 907,240, May 18, 1978, Pat. No. 4,157,989, which is a division of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Mar. 24, 1980, Ser. No. 133,232

Int. Cl.³ B01J *21/04, 23/58*

U.S. Cl. 252—466 PT **12 Claims**

1. A nonacidic catalytic composite comprising a catalytically effective amount of the pyrolyzed reaction product of a rhenium carbonyl component, wherein said rhenium carbonyl component is pyrolyzed in the presence of a reducing agent at a temperature of from about 300° F. to about 900° F., with a

porous carrier material containing a uniform dispersion of a platinum group component maintained in the elemental metallic state and an alkali or alkaline earth component.

4,292,208

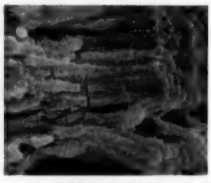
DIFFUSION COATING COMBINATIONS

Alfonso L. Baldi, Wynnewood, Pa., and Victor V. Damiano, Pennsauken, N.J., assignors to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 781,134, Mar. 25, 1977, abandoned, and Ser. No. 755,738, Dec. 30, 1976, Pat. No. 4,157,705, each is a continuation-in-part of Ser. No. 576,981, May 31, 1975, Pat. No. 4,041,196, said Ser. No. 755,738, and Ser. No. 576,981, each is a continuation-in-part of Ser. No. 507,126, Sep. 18, 1974, abandoned, said Ser. No. 576,981, and Ser. No. 507,126, each is a continuation-in-part of Ser. No. 466,908, May 3, 1974, Pat. No. 3,958,047, said Ser. No. 507,126, and Ser. No. 466,908, each is a continuation-in-part of Ser. No. 328,378, Jan. 31, 1973, Pat. No. 3,867,184. This application Jan. 3, 1979, Ser. No. 687

Int. Cl.³ B01J *23/16, 23/74;* **B32B** *15/14*

U.S. Cl. 252—470 **3 Claims**



1. A self-supporting iron web that has a visibly active pyrophoric surface in the form of a three-dimensional micro-fissured fragmentation into cells principally ranging from about 500 Angstroms to about 5000 Angstroms in size, and produced by dissolving out from that surface a different metal introduced by low-temperature activated pack diffusion into the surface of a starting web not over 20 mils thick.

3. A self-supporting web of a stainless alloy of iron that has a metal surface in the form of a three-dimensional micro-fissured fragmentation into cells principally ranging from about 500 Angstroms to about 5000 Angstroms in size and produced by dissolving out from that surface a different metal introduced by lower-temperature activated pack diffusion into the surface of a starting web not over 20 mils thick and having catalytic activity.

4,292,209

CERAMIC COMPONENT FOR MHD ELECTRODE

David D. Marchant, and Junior L. Bates, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 2, 1979, Ser. No. 35,158

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—521 **5 Claims**

1. A ceramic component for an MHD generator electrode having the formula: $Hf_xIn_yA_zO_2$ where x=0.1 to 0.4, y=0.3 to 0.6, z=0.1 to 0.4 and A is one or more elements selected from the group consisting of yttrium, ytterbium, terbium, praseodynium and cerium.

4,292,210

1-PHENYL- AND -BENZYL-2,2-DICHLORO-CYCLOPROPANES AS SCENTS

Götz Blume, and Hans-Otto Müller, both of Holzminden, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

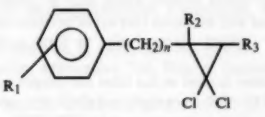
Filed Feb. 6, 1976, Ser. No. 656,059

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507778

Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 R **3 Claims**

1. A scented composition comprising a perfume as carrier and about 0.01 to 10 percent by weight of at least one compound of the formula



in which

R_1 denotes a hydrogen atom or a methyl, ethyl, propyl, methoxy or ethoxy group,

R_2 and R_3 independently of one another represent hydrogen atoms or methyl, ethyl or propyl groups,

n is 0 or 1 and

the total number of carbon atoms in the molecule is at most 12.

2. A scented composition according to claim **1**, wherein said compound is 2,2-dichloro-1-methyl-1-phenyl-cyclopropane.

4,292,211

FRAGRANCE DISPERSANT COMPOSITION

Justin Herman, Norwalk, Conn., assignor to Shaw Mudge & Company, Stamford, Conn.

Filed Jul. 31, 1980, Ser. No. 174,003

Int. Cl.³ A61K *7/46;* **C11B** *9/00;* **C11D** *3/50, 7/32*

U.S. Cl. 252—529 **17 Claims**

1. A fragrance dispersant composition for dispersing fragrance oil in an aqueous hard surface cleanser comprising a mixture of N(2-hydroxyethyl)acetamide comprising about 50 to about 80 weight percent of the fragrance dispersant composition, about 15% or more of an anionic surfactant capable of mixing with said N(2-hydroxyethyl) acetamide to form a homogeneous solution and an effective amount of fragrance oil, said anionic surfactant being present in an amount sufficient to solubilize said fragrance oil.

12. An aqueous hard surface cleanser comprising about 1 to about 40 weight percent N(2-hydroxyethyl)acetamide, about 0.5 to about 16 weight percent of one or more anionic surfactants capable of mixing with said N(2-hydroxyethyl)acetamide to form a homogeneous solution, an effective amount of fragrance oil, water, and one or more additional cleaning components suitable for use in such a cleanser.

4,292,212

SHAMPOO CREME RINSE

Allan L. Melby, Andover, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Nov. 29, 1978, Ser. No. 964,567

Int. Cl.³ A61K *7/08;* **C11D** *1/88, 1/94, 3/37*

U.S. Cl. 252—547 **1 Claim**

1. A shampoo-creme rinse composition comprising about 5 to 20 weight percent of at least one amphoteric detergent, about 5 to 20 weight percent of at least one anionic detergent and from about 0.1 to 5 weight percent of 3-(trimethylamino)-2-hydroxypropyl guar chloride salt wherein the guar chloride salt is derived from particulate guar wherein 69% by weight of the particles are 45 microns or smaller and 98% by weight of the particles are 105 microns or smaller.

4,292,213

CATALYST AND SOLVENT FREE EPOXY MATERIALS

Margaret L. Elliott, and Mary J. Wright, both of 922 W. Buchanan, Phoenix, Ariz. 85007

Continuation of Ser. No. 820,168, Jul. 29, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,785

Int. Cl.[3] B29H *19/00;* C08J *5/24;* C08G *30/14*

U.S. Cl. 260—2.3 12 Claims

1. A process for preparing an amine-hardened epoxy material based on epichlorohydrin/bisphenol A comprising the steps of:

mixing together by weight approximately 10% of an ester, approximately 79% of a first resin, approximately 6% of a plasticizer, and approximately 5% of a second resin to form a resin material,

mixing said resin material with a filler selected from the group of cured rubber alone and in combination with silica flour and mixtures thereof in predetermined proportions by weight, respectively, to form a resin material mixture,

if cured rubber is used as the filler the proportion is approximately 60%:40% by weight and if silica is used as the filler the proportion is approximately 27%:72%, respectively, by weight with 1% by weight of a coloring agent added,

said silica flour comprising equal parts by weight of 140 mesh, 200 mesh and 325 mesh material

mixing together by weight approximately 80% of a coreactant and approximately 20% of a phenol mixture to form a hardener material, and

mixing said resin material mixture with said hardener material in a proportion of approximately 50%:50% by weight,

said ester comprising a high boiling glycidyl ester of tertiary, saturated carbon-chain substituted, carboxylic acid, having an epoxide equivalent weight of 240 to 250,

said first resin comprising an epochlorohydrin/bisphenol A liquid resin having an epoxide equivalent weight in the range 182 to 194,

said plasticizer comprising a mixture of the monoglycidyl ether derivatives of the C_{15}-alkyl phenols obtained from cashew nut liquid, having an epoxide equivalent weight of about 490,

said second resin comprising an epichlorohydrin/bisphenol A liquid or solid resin having an epoxide equivalent weight of about 390 to 500, and

said co-reactant comprising a very low viscosity, resinous amidoamine adduct having an amine value of about 450.

4,292,214

PROCESS FOR THE PRODUCTION OF POLYURETHANE PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 13,139, Feb. 21, 1979, Pat. No. 4,226,982. This application Sep. 2, 1980, Ser. No. 182,997

Int. Cl.[3] C08L *97/02*

U.S. Cl. 260—9 31 Claims

1. The process for the production of polyurethane products by mixing and reacting the following components:

A: 1 to 200 parts by weight of a lignin-cellulose polyepoxy resin which is produced by mixing and reacting 10 to 200 parts by weight of a polyfunctional epoxide compound and 50 parts by weight of broken-down alkali metal plant polymer;

B: 50 to 100 parts by weight of a polyisocyanate or polyisothiocyanate.

4,292,215

AMINO MOLDING COMPOUND FOR COLD MANIFOLD INJECTION MOLDING

Donald B. Gore, Swanton; Ronald S. Krigbaum, Toledo, and James O. Peterson, Sylvania, all of Ohio, assignors to Plaskon Products, Inc., Toledo, Ohio

Filed Apr. 4, 1979, Ser. No. 26,974

Int. Cl.[3] C08L *1/00*

U.S. Cl. 260—17.3 10 Claims

1. In a method of forming a urea molding compound wherein a cellulosic filler is impregnated with an aqueous urea-formaldehyde prepolymer, condensate, resin or monomer, impregnated material is dried to form a corn and the corn is ground or mixed in combination with a lubricant and a catalyst system, the improvement which comprises combining urea and paraformaldehyde with the corn before or during grinding or mixing in quantities sufficient to lower the viscosity of the molding compound to a viscosity where the molding compound can be injected at an injection temperature of about 82° to 110° C. with an applied pressure of about 125 megapascals or less.

4,292,216

LIGNIN-BASED GLUE

Kurt H. Grunewald, Göteborg, and Inge G. Mansson, Kungälv, both of Sweden, assignors to Eka Aktiebolag, Surte, Sweden

Filed Dec. 11, 1979, Ser. No. 102,413

Claims priority, application Sweden, Dec. 28, 1978, 7813359

Int. Cl.[3] C08H *5/02;* C08G *8/08, 12/32*

U.S. Cl. 260—17.5 6 Claims

1. Glue for joining cellulose material, comprising aqueous chlorolignin with a molecular weight higher than 1000, in mixture with synthetic glue components selected from the group consisting of malamine-formaldehyde resin and phenol-formaldehyde resin, in a weight ratio between the chlorolignin and the synthetic glue components of between 100:20 and 20:80, as well as hardener and filler.

4,292,217

CATIONIC AQUEOUS EMULSION SYSTEMS

Arthur T. Spencer, New Providence, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 31,280, Apr. 18, 1979, abandoned, which is a division of Ser. No. 902,596, May 4, 1978, Pat. No. 4,169,080. This application May 12, 1980, Ser. No. 148,085

Int. Cl.[3] C08L *77/06, 91/00*

U.S. Cl. 260—18 N 6 Claims

1. A polyamide cross-linking agent adapted to provide the primary amine group in aqueous medium comprising a polyamide having a plurality of terminal primary amine groups, about one of said primary amine groups being ketimine blocked, and at least about 70% of the remaining isocyanate-reactive amino hydrogen atoms in said polyamide being reacted with one isocyanate group of an organic polyisocyanate to form a urea linkage, and the remaining isocyanate groups of said polyisocyanate being blocked with a volatile blocking agent to provide blocked isocyanate groups which are nonreactive at room temperature but which unblock at elevated temperatures.

4,292,218

LOW VISCOSITY UNSATURATED POLYESTER RESINS

Giovanni Corrado, 190, Via Gentile da Mogliano, Roma; Elvio Bertotti, 45, Corso Garibaldi, Colleferro, Roma, and Bruno Sopino, 21, Via Belvedere, Colleferro, all of Italy

Filed Dec. 27, 1979, Ser. No. 107,710

Claims priority, application Italy, Dec. 29, 1978, 31406 A/78

Int. Cl.[3] C08L *91/00;* C08G *63/52*

U.S. Cl. 260—22 CB 6 Claims

1. Low viscosity unsaturated polyester resins for making buttons, in all their marketable forms which can be made from

polyester resins, by conventional processing techniques such as centrifugation and casting, essentially comprising:

(A) an alkyd prepared by esterification of

(a) a compound selected from the group consisting of maleic anhydride, maleic acid, fumaric acid and mixtures thereof alone or in association with a compound selected from the group consisting of phthalic anhydride phthalic acid adipic acid, sebacic acid, dodecanedioic acid, and mixture thereof with

(b) one or more glycols, essentially comprising dipropylene glycol, and at least

(B) one ethylenically unsaturated monomer copolymerizable with (A), selected from the group consisting of styrene, vinyl toluene and a mixture thereof, in an amount of 20–30% by weight of the total (A)+(B), said unsaturated polyester resins being characterized in that said alkyd (A) has a molecular weight/double bond factor between 300 and 390 and an amount of free functional groups constituted by hydroxyl groups+carboxyl groups, from 80 to 100, inclusive expressed as mg of KOH per g of alkyd.

4,292,219

LATEX-BASE PAINT CONTAINING 2-METHOXY-2-PHENYL PROPANE OR 8-METHOXY-P-MENTHANE

James E. Lyons; Peter Hosler, both of Wallingford, Pa., asssignors to Suntech, Inc., Philadelphia, Pa.

Division of Ser. No. 863,569, Dec. 22, 1977, which is a continuation-in-part of Ser. No. 714,206, Aug. 23, 1976, abandoned. This application Dec. 10, 1979, Ser. No. 101,656

Int. Cl.³ C08K *5/06*

U.S. Cl. 260—29.6 ME **2 Claims**

1. A paint composition comprising a latex-base paint having incorporated therein from about 1 to 5 weight percent of 2-methoxy-2-phenylpropane as a paint-smoothing agent.

4,292,220

ADDITION POLYMER COMPRISING AIR-CURABLE ALKYL DIAMIDE

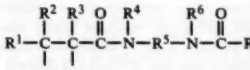
Ronald W. Novak, Chalfont, Pa., and Leslie R. Wolf, Bolingbrook, Ill., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 20, 1979, Ser. No. 106,061

Int. Cl.³ C08F *220/54, 220/50*

U.S. Cl. 260—23 AR **47 Claims**

1. An air-curable polymer of ethylenically unsaturated monomers wherein the polymer comprises diamide mer units of the formula



R^1 and R^3 individually being H, lower alkyl, $—COOR^8$, $—CONH_2$, $—CH_2COOR^9$, —CN or halogen;

R^2, R^4, R^6, R^8, and R^9 individually being H or lower alkyl;

R^5 being alkylene comprising two to 18 carbon atoms in a linear linkage between the two nitrogen atoms; and

R^7 being unsaturated, air-curable alkyl.

4,292,221

PREPARATION OF MODIFIED PETROLEUM RESINS

Alberto Malatesta, Brussels, Belgium, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 22,080, Mar. 19, 1979, Pat. No. 4,242,244. This application Jun. 23, 1980, Ser. No. 162,259

Claims priority, application United Kingdom, Jun. 22, 1979, 21858/79

Int. Cl.³ C09D *3/733, 11/10*

U.S. Cl. 260—23.7 C **4 Claims**

1. A process for the production of a modified petroleum resin comprising heating a mixture of (A) cyclopentadiene and/or methyl cyclopentadiene and/or the dimers or codimers thereof and (B) from 1 to 15 wt.% of (A) of a saturated or ethylenically unsaturated C_7 or higher fatty acid at a temperature in the range of 270° C. to 290° C. under a sufficient pressure to maintain the mixture in the liquid phase to obtain a resin with an acid number below 20.

4,292,222

HOMOGENEOUS THERMOPLASTIC MIXTURES OF PROPYLENE-ETHYLENE COPOLYMERS AND LIQUID, SATURATED DIORGANOPOLYSILOXANES WITHIN A CERTAIN VISCOSITY RANGE

Ulrich Grigo, Krefeld; Leo Morbitzer, Cologne; Klaus-Peter Arlt, Senden/Muenster; Rüdolf Binsack, Krefeld, and Josef Merten, Korschenbroich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 8, 1980, Ser. No. 119,939

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1979, 2905356

Int. Cl.³ C08L *23/10, 23/04, 83/04*

U.S. Cl. 260—29.1 SB **7 Claims**

1. A homogeneous thermoplastic mixture comprising

(A) from 85 to 99.5% by weight of a propylene-ethylene copolymer containing from 0.5 to 15% by weight of copolymerised ethylene units and having a melt index of from 1.0 to 30 g/min at 230° C. and under a load of 5 kg; and

(B) from 0.5 to 15% by weight of a saturated diorganopolysiloxane having a viscosity of from 30,000 to 80,000 Cst at 20° C.

4,292,223

HIGHLY FILLED THERMALLY CONDUCTIVE ELASTOMERS I

Ares N. Theodore, Farmington Hills; Robert A. Pett, Franklin, and S. Burhan A. Qaderi, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

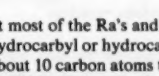
Filed Jan. 4, 1980, Ser. No. 109,445

Int. Cl.³ C08L *83/04*

U.S. Cl. 260—29.1 SB **10 Claims**

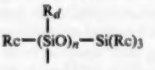
1. A dispensable precursor compoisition for highly filled, thermally conductive elastomers that is adapated to fill deep section mold cavities, which compositions consists essentially of:

I. 100 parts by weight of an olefinically unsaturated crosslinkable polysiloxane having the formula:



I

wherein at least most of the Ra's and Rb's are selected from (A) saturated hydrocarbyl or hydrocarbyloxy groups having a total of 1 to about 10 carbon atoms that are alkyl or aryl or alkyl and aryl and (B) allyl or vinyl groups, but wherein up to about 25% of the Rb's may be



I(a)

wherein at least most of the Rc's and Rd's are selected from (A) and (B) above but up to about 10% of the Rd's may contain additional siloxane units with substituents selected from (A) and (B) or still additional siloxane units; and still further wherein (1) the average number of m plus n per polyme· molecule is between about 100 and 300 and (2)

there is an average total of above about 1.5 but lower than 6 crosslinking sites selected from the vinyl, allyl or vinyl and allyl groups per polymer molecule;

II. about 60–500 parts by weight of finely divided particulate comprising:

(A) silica particulate at a weight ratio to the polysiloxane of I. of between about 0.3 to 2.5:1 wherein the silica particulate comprises:

1. ground silica having an average particule diameter between about 0.1 and 15 microns; and
2. fumed silica having an average particule diameter between about 0.005 and 0.015 microns;

(B) thermally conductive powder at a weight ratio to the polysiloxane of I. of between about 0.3 to 2.5:1;

III. a viscosity modified comprising a silicone oil having a viscosity between about 5000–1,000,000 centistokes at 25° C. at a weight ratio to the particulate of II of between about 1:20–1:4 oil to particulate; and

IV. a silyl hydride functional polysiloxane oligomer containing between about 5–50 siloxane groups that crosslinks with I at a weight ratio with respect to the polysiloxane of I. of between about 1:3 to 1:20, the silyl hydride functional polysiloxane oligomer having an average of up to about 20 silyl hydride groups per polymer chain.

4,292,224

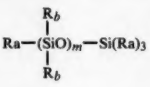
HIGHLY FILLED THERMALLY CONDUCTIVE ELASTOMERS II

Ares N. Theodore, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1980, Ser. No. 109,440
Int. Cl.³ C08L *83/04*
U.S. Cl. 260—29.1 SB **10 Claims**

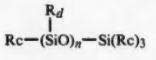
1. A dispensable precursor composition for highly filled, thermally conductive elastomers which composition consists essentially of

I. 100 parts by weight of an olefinically unsaturated polysiloxane having the formula:



I

wherein at least most of the Ra's and Rb's are selected from (A) saturated hydrocarbyl or hydrocarbyloxy groups having a total of 1 to about 10 carbon atoms that are alkyl or aryl or alkyl and aryl and (B) allyl or vinyl groups, but wherein up to about 25% of the Rb's may be



I(a)

wherein at least most of the Rc's and Rd's are selected from (A) and (B) above but up to about 10% of the Rd's may contain additional siloxane units with substituents selected from (A) and (B) or still additional siloxane units; and still further wherein (1) the average number of siloxane units per polymer molecule is between 100 and 300 and (2) there is an average of above about 1.5 but lower than 6 crosslinking sites selected from the vinyl, allyl or vinyl and allyl groups per polymer molecule;

II. about 35–550 parts by weight of finely divided particulate comprising:

(A) silica particulate at a weight ratio to the polysiloxane of I. of between about 1:4 to 3:1 wherein the silica particulate comprises:

1. ground silica having an average particle diameter between about 0.1 and 15 microns; and
2. fumed silica having an average particle diameter between about 0.005 and 0.015 microns;

(B) thermally conductive carbon powder at a weight ratio to the polysiloxane of I. of between about 1:10 to 2.5:1;

III. a viscosity modifier comprising a silicone oil having a viscosity between about 1000–1,000,000 centistokes at 25° C. at a weight ratio to the particulate of II of between about 1:20 to 1:4 oil to particulate; and

IV. a silyl hydride functional polysiloxane oligomer containing between about 5–50 siloxane groups that crosslinks with I at a weight ratio with respect to the polysiloxane of I. of between about 1:3 to 1:20, the silyl hydride functional polysiloxane oligomers having an average of up to about 20 silyl hydride groups per polymer chain.

4,292,225

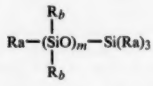
HIGHLY FILLED THERMALLY CONDUCTIVE ELASTOMERS IV

Ares N. Theodore, Farmington Hills, and Marvin A. Lemieux, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1980, Ser. No. 109,439
Int. Cl.³ C08L *83/04*
U.S. Cl. 260—29.1 SB **9 Claims**

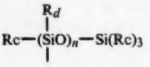
1. A thick, highly filled elastomer body made by filling a cavity with a dispensible elastomer precursor, which precursor consists essentially of:

I. 100 parts by weight of an olefinically unsaturated crosslinkable polysiloxane having the formula:



I

wherein at least most of the Ra's and Rb's are selected from (A) saturated hydrocarbyl or hydrocarbyloxy groups having 1 to about 10 carbon atoms that are alkyl or aryl or alkyl and aryl and (B) allyl or vinyl groups but wherein up to about 25% of the Rb's may be



I(a)

wherein at least most of the Rc's and Rd's are selected from (A) and (B) above but up to about 10% of the Rd's may contain additional siloxane units with substituents selected from (A) and (B) or still additional siloxane units; and still further wherein (1) the average number of siloxane units per polymer molecule is between 100 and 300 and (2) there is an average of above about 1.5 but lower than 6 crosslinking sites selected from the vinyl, allyl or vinyl and allyl groups per polymer molecule;

II. about 60–500 parts by weight of finely divided particulate comprising:

(A) silica particulate at a weight ratio to the polysiloxane of I. of between about 0.3 to 2.5:1 wherein the silica particulate comprises:

1. ground silica having an average particule diameter between about 0.1 and 15 microns; and
2. fumed silica having an average particule diameter between about 0.005 and 0.015 microns;

(B) conductive boron refractory particulate at a weight ratio to the polysiloxane of I. of between about 0.3: 1 to 2.5:1;

III. a viscosity modifier comprising a silicone oil having a viscosity between about 5000–1,000,000 centistokes at 25° C. at a weight ratio to the particulate of II of between about 1:20–1:4 oil to particulate; and

IV. a silyl hydride functional polysiloxane oligomer containing between about 5–50 siloxane groups that crosslinks

with I at a weight ratio with respect to the polysiloxane of I. of between about 1:3 to 1:20, the silyl hydride functional polysiloxane oligomer having an average of up to about 20 silyl hydride groups per polymer chain.

4,292,226

PROCESS FOR THE PRODUCTION OF AQUEOUS DISPERSIONS OR SOLUTIONS OF POLYURETHANE POLYUREAS, AND DISPERSIONS OR SOLUTION OBTAINABLE BY THIS PROCESS AND THEIR USE

Wolfgang Wenzel, Bergisch-Gladbach, and Walter Meckel, Neuss, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 24, 1979, Ser. No. 78,542

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843790

Int. Cl.³ C08L *75/12*

U.S. Cl. 260—29.2 TN **14 Claims**

1. A process for the production of stable aqueous dispersions or solutions of polyurethanepolyureas by reacting in the aqueous phase prepolymers containing at least two free isocyanate groups and chemically incorporated hydrophilic groups or external chemically non-bound emulsifiers or both with chain-extending agents characterized in that

(a) isocyanate-group-containing prepolymers modified by the incorporation of hydrophilic groups or containing external emulsifiers or both are mixed in liquid form or in solution in inert solvents in the absence of water with

(b) solid adducts, insoluble in the prepolymers or their solutions, of

(ba) amines containing at least two primary or secondary amino groups or hydrazines containing at least one hydrogen atom on both nitrogen atoms and

(bb) inorganic or organic acids to form a suspension and the suspension thus formed is subsequently mixed with water.

4,292,227

STABLE SUPERSATURATED SOLUTIONS OF SPARINGLY SOLUBLE SALTS

Alan S. Michaels, San Francisco; Michael W. Weiner, Stanford, both of Calif., and Hemant Jalan, Chicago, Ill., assignors to Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Dec. 10, 1979, Ser. No. 102,215

Int. Cl.³ B01D *11/04, 13/00*

U.S. Cl. 260—29.6 H **14 Claims**

1. A method for preparing supersaturated aqueous solutions of sparingly soluble inorganic salts of alkali metals, said method comprising:

forming a supersaturated solution of said sparingly soluble inorganic salt in an aqueous medium, wherein the saturation limit of said salt is exceeded in said aqueous medium in the presence of a polyanionic polyelectrolyte present in said solution in sufficient amount to stabilize said sparingly soluble salt in solution, said polyelectrolyte being of at least about 900 daltons and having at least five ionizable groups.

4,292,228

PHYSICAL PROPERTY IMPROVEMENT IN NITRILE RESINS BY USE OF CERTAIN PROCESSING AIDS AND FILLERS

Ralph E. Isley, Northfield, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 29, 1979, Ser. No. 70,591

Int. Cl.³ C08K *5/15*

U.S. Cl. 260—30.4 A **12 Claims**

1. The composition comprising a blend of a resin, from 2 to 50 parts by weight per hundred parts by weight of resin of an polycarboxylic acid anhydride processing aid, and from 5 to 400 parts by weight per 100 parts by weight of resin of a filler selected from the group consisting of calcium carbonate, magnesium carbonate, basic lead carbonate, zinc carbonate, aluminum hydroxide (hydrated), calcium hydroxide, lead hydroxide, zinc chromate, aluminum oxide, calcium oxide, chromium oxide, iron oxide, magnesium oxide, lead oxides, titanium dioxide, zinc oxide, aluminum silicate (hydrated), magnesium aluminum silicate, potassium aluminum silicate, sodium aluminum silicate, amorphous silica, calcium meta silicate, calcium silicate, diatomaceous silica, magnesium silicate, basic lead sulfate, barium sulfate, calcium sulfate, cadmium sulfide, mercuric sulfide and lead sulfide said resin being a polymer which results from the polymerization of

(A) from 60 to 90% by weight of at least one nitrile having the structure

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

(B) from 10 to 40% by weight based on the combined weight of (A) and (B) of an ester having the structure

$$CH_2=\underset{\displaystyle R_1}{\underset{|}{C}}-COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

in the presence of from 1 to 40 parts by weight of

(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally a comonomer selected from the group consisting of styrene, a nitrile monomer having the structure

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-CN$$

wherein R has the foregoing designation, and an ester having the structure

$$CH_2=\underset{\displaystyle R_1}{\underset{|}{C}}-COOR_2$$

wherein R_1 and R_2 have the foregoing designations, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

4,292,229

ADHESIVES

Dieter A. Hechenberger, Esch, and Angelika Neye, Baden, both of Fed. Rep. of Germany, assignors to Lingner + Fischer, Fed. Rep. of Germany

Filed Aug. 20, 1980, Ser. No. 179,764

Claims priority, application United Kingdom, Aug. 22, 1979, 29226/79

Int. Cl.³ C09J *3/00, 3/12*

U.S. Cl. 260—30.6 R **9 Claims**

1. A synthetic-rubber-based solvent adhesive for use in glue-sticks characterised in that the adhesive comprises a solution of:

(a) a linear branched-chain polyurethane rubber,

(b) a carboxylated butadiene-acrylonitrile rubber, containing at least 50% butadiene by weight, and

(c) the reaction product of sorbitol and benzaldehyde in a non-aqeuous solvent system.

4,292,230

SCREEN-PRINTING COMPOSITION AND USE THEREOF

Eugene J. Kenney, Apalachin; Donald J. Lazzarini, Binghamton, and Robert J. Winters, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

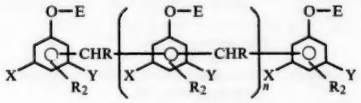
Filed Sep. 27, 1978, Ser. No. 946,008

Int. Cl.³ C08K *3/36*

U.S. Cl. 260—33.2 EP **32 Claims**

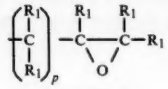
1. A screen-printing curable composition consisting essentially of:

(A) about 31 to about 55% by weight of a non-liquid epoxidized novola k represented by the formula:



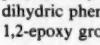
(1)

wherein n is at least about 0.2; E is hydrogen or an epoxyalkyl group, at least two E groups per polymer molecule being an epoxyalkyl group and wherein the epoxyalkyl group is represented by the formula:



p is an integer from 1-8; R is hydrogen or alkyl or alkylene or aryl or aralkyl or alkaryl or cycloalkyl or furyl group; each R_1 individually is hydrogen or alkyl group of up to 7 carbon atoms; wherein the number of carbon atoms in any epoxy-alkyl group totals no more than 10 carbon atoms; each X and Y is individually hydrogen or chlorine or alkyl or hydroxyl; each R_2 individually is hydrogen or chlorine or a hydro-carbon group;

(B) about 6 to about 12% by weight of a thermoplastic polyhydroxy ether reaction product of a polynuclear dihydric phenol and epichlorohydrin substantially free of 1,2-epoxy groups having the formula:



wherein A is the radical residuum of a polynuclear dihydric phenol, B is an hydroxyl-containing radical residuum of epichlorohydrin, and m is at least 30;

(C) about 15 to about 21% of weight of a liquid anhydride of carboxylic acid;

(D) about 4.5 to about 6% by weight of colloidal silica and wherein said colloidal silica has a surface area of about 50 to about 400 m^2/gram and the particles have a diameter of about 5 to about 20 millimicrons; and

(E) volatile diluent in an amount sufficient to provide a composition with a viscosity of about 14,000 to about 50,000 centipoises determined with a Haake Rotovisco with a shear rate of 249.6/sec. for 1.28 minutes at 25° C.; and wherein the ratio of (A):(B) is about 7:1 to aout 4:1, the above amounts being based upon the total of (A), (B), (C), (D), and (E) in said composition.

4,292,231

PRESSURE SENSITIVE ADHESION COMPOSITIONS

Hans R. L. Gabriel, Mariemont; Larry K. Post, Columbus; Billy M. Culbertson, Worthington, all of Ohio, and Curtis M. Graham, Lilburn, Ga., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 26, 1980, Ser. No. 124,675

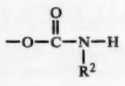
Int. Cl.³ C08F *8/42;* **C08K** *5/05;* **C08F** *226/02;* **C08L** *33/08*

U.S. Cl. 260—33.4 UR **10 Claims**

1. An organic solvent solution comprising;

(a) an interpolymer comprising:

1. 0.2 to 20 weight percent of a vinyl monomer, said monomer containing both a carboxylic acid and a carbamate functionality wherein said carbamate functionality has the following general formula



wherein R^2 represents hydrogen, alkyl, aryl, substituted alkyl and substituted aryl groups;

2. at least 40 weight percent of an ester of acrylic or methacrylic acid containing 7 to 20 carbon atoms;

3. optionally up to 59.8 weight percent of one or more copolymerizable monomers containing an ethylenically unsaturated linkage as the only reactive functional group, said copolymerizable monomers having no more than 25 carbon atoms; and

(b) a metal alkoxide having the formula $R_nT(OR_1)_z$ wherein T is a metal selected from the Group II, III, IV and V of the Periodic Table, R is selected from the group consisting of alkyl radicals of from 1 to 8 carbon atoms and aryl radicals of from 6 to 16 carbon atoms, R_1 is selected from the group consisting of aliphatic and substituted aliphatic radicals containing from 1 to 18 carbon atoms, n is an integer whose value is 0 or greater and z is an integer whose value is at least 2 wherein the sum of n+z is greater than 1 and equal to the valence of the metal represented by T.

4,292,232

PROCESS FOR THE MASS COLORATION OF THERMOPLASTICS WITH ANTHRAQUINONYLAMINOTRAIZINES

Joachim Dazzi, Riehen; Max Jost, Oberwil, and Arnold Wick, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,644

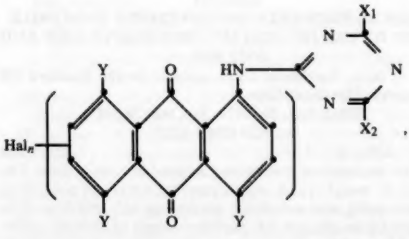
Claims priority, application Switzerland, Nov. 23, 1978, 12027/78

Int. Cl.³ C08L *67/00*

U.S. Cl. 260—40 P **10 Claims**

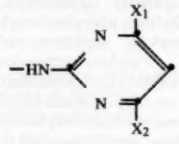
1. A process for the mass coloration of a thermoplastic in the melt in which the coloration is effected by

incorporating in said thermoplastic in the melt an effective amount of an anthraquinonylaminotriazine of the formula (1)



(1)

wherein each of X_1 and X_2 is an alkylmercapto or arylmercapto group or a group of the formula $—NR_1R_2$, in which each of R_1 and R_2 is alkyl, cycloalkyl, aralkyl or aryl, and R_2 can additionally be hydrogen, or R_1 and R_2 together with the nitrogen atom to which they are attached form a 5- or 6-membered ring or are morpholino, one Y is a hydrogen or chlorine atom, a hydroxy, arylmercapto, alkanoylamino or aroylamino group, or a group of the formula



and the other Ys are hydrogen atoms, Hal is a chlorine or bromine atom, and n is 0 or 1.

4,292,233

HIGH-IMPACT POLYBUTYLENE TEREPHTHALATE

Rudolf Binsack, Krefeld; Dieter Rempel, Leverkusen; Gert Humme, Odenthal, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 165,259

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1979, 2927576

Int. Cl.³ C08L *67/00*

U.S. Cl. 260—40 R **10 Claims**

1. Mixtures of

A. from 65 to 99% by weight of polybutylene terephthalate, and

B. from 1 to 35% by weight of ABS graft polymer, the above percentages being based on the sum of A+B and the graft polymer B being obtainable by grafting

I. from 10 to 40% by weight, based on B, of a mixture of

(a) from 10 to 35% by weight, based on the sum of a+b, of acrylonitrile, and

(b) from 65 to 90% by weight, based on the sum of a+b, of styrene onto

II. from 60 to 90% by weight, based on B, of cross-linked butadiene polymer containing at least 70% by weight, based on II, of butadiene residues as the graft base,

characterised in that the gel content of graft base II amounts to at least 70% (as measured in toluene), the degree of grafting G is from 0.15 to 0.55 and the average particle diameter d_{50} of the ABS graft polymer B is from 0.2 to 0.6 μm.

10. Mixtures as claimed in claim 1, characterised in that they contain 5 to 50% by weight of glass fibers, based on the sum of A+B+glass fibers.

4,292,234

SILANE REINFORCING PROMOTERS IN REINFORCEMENT OF SILICA-FILLED RUBBERS

Albert W. Borel, Jennings, La., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Mar. 30, 1979, Ser. No. 25,508

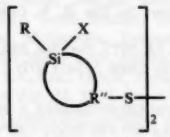
Int. Cl.³ C08K *9/06*

U.S. Cl. 260—42.15 **16 Claims**

1. A compound suitable for use as a coupling agent in the silica filler reinforcement of a rubber, said compound being represented by one of the formula

$$(RO)_{3-n}R_n'Si(CH_2)_xY \qquad (I)$$

wherein R and R' are at least one of a linear or branched alkyl or cycloalkyl group having from 1 to 10 carbon atoms or an aromatic or substituted aromatic group having from 6 to 10 carbon atoms, x is an integer from 1 to 20 and Y is one of an azide and a thiosulfenamide, and



(II)

wherein X is at least one of a halogen and an alkoxy (—OR) group wherein R in said formulas and in said group is as previously defined herein, and R'' is a trivalent hydrocarbon radical having 2 to 10 carbon atoms.

3. A silica reinforced rubber containing a compound according to claim 1.

4,292,235

FIBER GLASS REINFORCED RESIN COMPOSITIONS

Yasuo Uemoto, Yokohama; Shigenori Togami, Kamakura, both of Japan; Tsumoru Takano, deceased, late of Kamakura, Japan (by Misayo Takano, legal representative); Ichiro Ono, Hatano, and Takashi Kayama, Yokohama, both of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Sep. 4, 1979, Ser. No. 72,518

Claims priority, application Japan, Sep. 4, 1978, 53-107581

Int. Cl.³ C08K *7/14*

U.S. Cl. 260—42.18 **4 Claims**

1. Fiber glass reinforced resin compositions having improved water resistance which comprise an acrylic copolymer containing methyl methacrylate as the main component, fiber glass for reinforcement and a phosphorus compound having one or more pentavalent phosphorus atoms in its molecule, said phosphorus compound being present in an amount of 0.01 to 5 parts by weight based on 100 parts by weight of the acrylic copolymer.

4,292,236

COMPOSITION FOR REPAIR OF PORCELAIN FIXTURES

Robert L. Ibsen, and William R. Reed, Jr., both of Santa Maria, Calif., assignors to Den-Mat, Inc., Santa Maria, Calif.

Filed Nov. 16, 1979, Ser. No. 94,956

Int. Cl.³ C08K *3/36*; C09K *5/15*

U.S. Cl. 260—42.52 **10 Claims**

1. A composition for repairing porcelain fixtures including in combination a mixture of:

A. 10 to 50% by weight of a solids component containing, in powder form:

Ingredient	Parts by Weight
1. Powdered frit of glass or silica	10 to 50
2. Poly (ethyl methacrylate)	90 to 50
3. Silane coupling agent	1.5 to 3
4. Cure initiator	1.5 to 3
5. White pigment	1.5 to 16.5, and

B. 90 to 50% by weight of a liquid binder containing:

Ingredient	Parts by Weight
1. Aliphatic monoacrylate	40 to 60
2. Tetrahydrofurfuryl methacrylate	40 to 60
3. Butyl hydroxytoluene	0.05 to 1.5
4. 2-hydroxyethyl-p-toluene	0.1 to 10

4,292,237
POLYMERIC ULTRAVIOLET LIGHT STABILIZERS CONTAINING HINDERED ALKYL AMINES

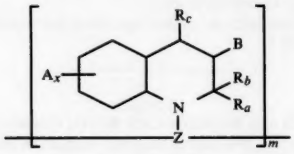
Robert W. Layer, Cuyahoga Falls, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 14, 1977, Ser. No. 850,994

Int. Cl.[3] **C07D** *215/06;* **C08K** *5/34;* **C07D** *215/12, 215/14*

U.S. Cl. 260—45.8 NW **9 Claims**

1. A polymer composition comprising a polymer which is sensitive to degradation from ultraviolet light irradiation and, in an amount sufficient to enhance said polymers' resistance to such degradation, a stabilizer polymer having structural units corresponding to the following formula:



wherein R_a, R_b, and R_c are independently selected from alkyl groups containing 1 to about 12 carbon atoms, a cyclohexyl group, or cyclohexylalkyl groups containing 7 to about 14 carbon atoms; A is selected from the group consisting of alkyl groups containing 1 to about 24 carbon atoms, hydroxyalkyl groups containing 1 to about 18 carbon atoms, alkoxy groups containing 1 to about 12 carbon atoms in the group, ester groups containing a total of from 2 to about 24 carbon atoms in the group, a cyclohexyl group, cyclohexylalkyl groups containing 7 to about 14 carbon atoms in the group, hydroxy groups, amino groups and aminoalkyl groups and alkyl-substituted amino and aminoalkyl groups wherein the alkyl contains 1 to about 12 carbon atoms; Z is a segment of the polymer backbone derived from an olefinic monomer, X is 0, 1, 2 or 3; and B is hydrogen, an alkyl group containing 1 to about 12 carbon atoms, a cyclohexyl group, or a cyclohexylalkyl group of 7 to about 14 carbon atoms in the group; and m is at least 2.

4,292,238
ALKYLATION OF BENZTHIAZOLE-AZO-PHENYLAMINE DYESTUFFS

Hans-Peter Kühlthau, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

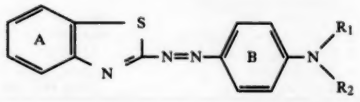
Filed May 19, 1977, Ser. No. 798,476

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623162

Int. Cl.[3] **C09B** *43/11, 44/20;* **D06P** *1/41, 3/76*

U.S. Cl. 260—158 **5 Claims**

1. Process for the preparation of an alkylated dyestuff, wherein a benzthiazole dyestuff of the formula



wherein

R_1 and R_2 independently of one another denote hydrogen, alkyl, alkenyl, cycloalkyl, aryl or aralkyl, or, when joined together are pyrrolidinyl, piperidinyl, or morpholinyl;

R_1, in addition, when joined to the ortho-position of ring B, forms dihydroindolyl, tetrahydroquinolinyl, or hexahydrocarbazolyl;

rings A and B are unsubstituted or substituted with fluoro, chloro, bromo, nitro, cyano, formyl, ureido, aminocarbonyl, aminosulphonyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylcarbonyl, C_1–C_4-alkylcarbonyloxy, C_1–C_4-alkoxycarbonyloxy, C_1–C_4-alkylcarbonylamino, C_1–C_4-alkylaminocarbonyloxy, C_1–C_4-alkylsulphonylamino, C_1–C_4-alkylureido, C_1–C_4-alkoxycarbonylamino, C_1–C_4-alkylaminocarbonyl, C_1–C_4-dialkylaminocarbonyl, N-C_1–C_4-alkyl-N-phenylaminocarbonyl, C_1–C_4-alkylaminosulphonyl, C_1–C_4-dialkylaminosulphonyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkoxysulphonyl-C_1–C_4-alkylamino, C_1–C_4-alkylsulphonyl-C_1–C_4-alkylamino, phenoxy, naphthoxy, phenoxy-C_1–C_4-alkoxy, naphthoxy-C_1–C_4-alkoxy, phenylthio, naphthylthio, phenylcarbonyl, naphthylcarbonyl, phenoxycarbonyloxy, naphthoxy-carbonyloxy, phenylcarbonyloxy, naphthylcarbonyloxy, phenylcarbonylamino, naphthylcarbonylamino, phenylaminocarbonyloxy, naphthylaminocarbonyloxy, phenylsulphenylamino, naphthylsulphonylamino, phenylsulphonyl-C_1–C_4-alkylamino, naphthylsulphonyl-C_1–C_4-alkylamino, phenylureido, naphthylureido, phenoxycarbonylamino, naphthoxycarbonylamino, phenylsulphonyl, naphthylsulphonyl, phenoxycarbonyl, naphthoxycarbonyl, phenoxysulphonyl, naphthoxysulphonyl, benzoxy, phenylethyloxy, benzylthio, phenylethylthio, benzylcarbonyl, phenylethylcarbonyl, benzylsulphonyl, phenylethylsulphonyl, benzoxycarbonyl, phenylethyloxycarbonyl, cyclopentyl, cyclohexyl, cyclopentyl-C_1–C_4-alkoxy, cyclohexyl-C_1–C_4-alkoxy, a fused benzene ring, or a fused tetrahydrobenzene ring;

the process wherein said dyestuff is alkylated with an ester of the formula

$$R_3—SO_3R$$

wherein

R is alkyl and

R_3 is aryl or alkoxy;

in an organic solvent immiscible with water, the alkylation being brought to completion at 30° C. to 80° C. after addition of 5–100% by volume of the reaction volume of water and 0.05–0.5 mol, relative to the amount of dyestuff, of the alkylester employed for alkylation.

4,292,239
BENZISOTHIAZOLE AZO DYESTUFFS CONTAINING POLYETHER GROUPS

Winfried Kruckenberg, and Karl H. Schündehütte, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

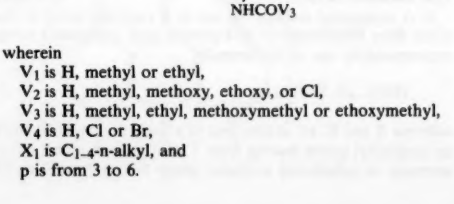
Filed Aug. 13, 1979, Ser. No. 65,777

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837960

Int. Cl.[3] **C09B** *29/045, 29/09, 29/26;* **D06P** *3/52*

U.S. Cl. 260—158 **2 Claims**

1. A dyestuff of the formula



wherein

V_1 is H, methyl or ethyl,

V_2 is H, methyl, methoxy, ethoxy, or Cl,

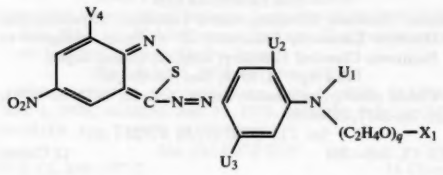
V_3 is H, methyl, ethyl, methoxymethyl or ethoxymethyl,

V_4 is H, Cl or Br,

X_1 is C_{1-4}-n-alkyl, and

p is from 3 to 6.

2. A dyestuff of the formula



wherein

U_1 is hydrogen, methoxyethyl, ethoxyethyl, methyl or ethyl,
U_2 is methyl, methoxy or hydrogen,
U_3 is methoxy, methyl or hydrogen,
X_1 is C_{1-4}-n-alkyl, and
q is 4, 5 or 6.

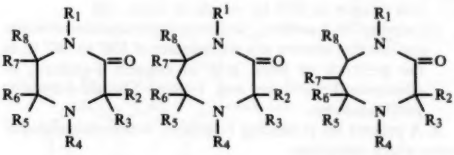
4,292,240

2-KETO-1,4-DIAZACYCLOALKANES

John T. Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 835,065, Sep. 21, 1977, Pat. No. 4,190,571. This application Oct. 26, 1979, Ser. No. 88,484
Int. Cl.³ C07D *243/08*
U.S. Cl. 260—239.3 R **2 Claims**

1. A compound having one of the formulae



wherein,

R_1 and R_4 independently represent hydrogen, alkyl having from 1 to 24 carbon atoms, hydroxyalkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, aminoalkyl having from 1 to 12 carbon atoms, alkenyl having from 2 to 14 carbon atoms, and unsubstituted hydrocarbon aralkyl having from 7 to 14 carbon atoms;

R_4 optionally also represents oxygen, hydroxy or alkoxy;

R_2 and R_3 independently represent alkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, aminoalkyl having from 1 to 12 carbon atoms, cycloalkyl having from 5 to 14 carbon atoms, hydroxy-cycloalkyl having from 5 to 14 carbon atoms, alkenyl having from 2 to 14 carbon atoms, and unsubstituted hydrocarbon aralkyl having from 7 to 14 carbon atoms;

R_5, R_6, R_7, R_8 independently represent alkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, aminoalkyl having from 1 to 12 carbon atoms, alkenyl having from 2 to 14 carbon atoms, and unsubstituted hydrocarbon aralkyl having from 7 to 14 carbon atoms;

so that when R_2, R_3 is cyclized having from 4 to 6 unsubstituted methylene groups, and R_5, R_6 is also cyclized having from 4 to 6 unsubstituted methylene groups, each cyclized substituent is different;

R_7, R_8 additionally also represent hydrogen; and,

R_7, R_8, may when taken together with the carbon atom to which they are attached, form a polymethylene ring having from 5 to 6 carbon atoms.

4,292,241

ANTIBIOTIC PA-31088-IV AND PRODUCTION THEREOF

Kentaro Tanaka, Suita; Jun'ichi Shoji, Hirakata; Yoshimi Kawamura, Mino; Teruo Hattori, Takarazuka; Eiji Kondo, Ikeda; Kouichi Matsumoto, Toyonaka; Tadashi Yoshida, Takarazuka, and Naoki Tsuji, Ashiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jan. 25, 1980, Ser. No. 115,278
Claims priority, application Japan, Apr. 6, 1979, 54-42347
Int. Cl.³ C07D *487/04;* A61K *31/40*
U.S. Cl. 260—245.2 T **2 Claims**

1. An antibiotic PA-31088-IV, 3-[(2-acetamidoethylene)sulfonyl]-6-(2-hydroxy-1-methylethylidene)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid or a pharmaceutically acceptable salt thereof.

4,292,242

PRODUCTION OF AMINES

Richard M. Laine, Mountain View, Calif., assignor to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 967,028, Dec. 6, 1978, Pat. No. 4,226,845. This application Aug. 26, 1980, Ser. No. 181,419
Int. Cl.³ C07C *85/08, 85/18;* C07D *207/06, 239/02*
U.S. Cl. 260—326.8 **6 Claims**

1. In the production of an amine by the aminomethylation of an olefin wherein an olefin is reacted with ammonia, a primary amine or a secondary amine in the presence of carbon monoxide and water or hydrogen, and in the production of an amine by reaction of an aldehyde with ammonia, a primary amine or a secondary amine in the presence of carbon monoxide and water or hydrogen, and wherein a homogeneous catalyst in the form of a solution of a catalyst in a solvent is used, the improvement which comprises employing a mixed ruthenium carbonyl/iron carbonyl as a catalyst.

4,292,243

3''-PHENYLDISPIRO[1,3-DIOXOLANE-2,4'-CYCLOHEXANE-1',1''-(3''H)-ISOBENZOFURAN]

Lawrence L. Martin, Lebanon, N.J., and Manfred Worm, Wiesbaden-Naurod, Fed. Rep. of Germany, assignors to Hoechst Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Division of Ser. No. 73,055, Sep. 6, 1979, Pat. No. 4,263,317. This application Nov. 28, 1980, Ser. No. 211,151
Int. Cl.³ C07D *323/00*
U.S. Cl. 260—340.9 R **1 Claim**

1. 3''-Phenyldispiro[1,3-dioxolane-2,4'-cyclohexane-1',1''-(3''H)-isobenzofuran].

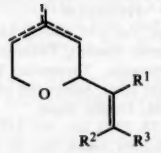
4,292,244

NOVEL 2,4-DISUBSTITUTED PYRAN DERIVATIVES, THEIR PREPARATION AND THEIR USE AS SCENTS

Werner Hoffmann, Neuhofen, and Frank Thoemel, Weinheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 154,900
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2925043
Int. Cl.³ C07D *309/20, 309/24, 309/26, 309/22*
U.S. Cl. 260—345.1 **1 Claim**

1. 2,4-Disubstituted pyran derivatives of the general formula I



(I)

where R^1 and R^2 are each hydrogen or methyl and R^3 is —CH_2OH, —CH_2—O—$COCH_3$, —CH_2—OCHO, —CH_2—O—COC_2H_5, —$COOCH_3$, —$COOC_2H_5$, —$COOC_3H_7$, —CH_2Cl, —CH_2Br, —CH_2I or —CHO, and which possess a double bond within the region shown by the broken line.

4,292,245

3'-PHENYLSPIRO[CYCLOHEXANE-1,1'(3'H)-ISOBENZOFURAN]-4-ONE

Lawrence L. Martin, Lebanon, N.J., and Manfred Worm, Wiesbaden-Naurod, Fed. Rep. of Germany, assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Division of Ser. No. 73,055, Sep. 6, 1979, Pat. No. 4,263,317. This application Nov. 28, 1980, Ser. No. 211,149

Int. Cl.³ C07D *307/94*

U.S. Cl. 260—346.22 **1 Claim**

1. 3'-Phenylspiro[cyclohexane-1,1'(3'H)-isobenzofuran]-4-one.

4,292,246

PREPARATION OF TETRAHYDROFURAN-3-ALDEHYDES

Hans-Dieter Scharf, Roetgen, and Herbert Fraüenrath, Aachen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

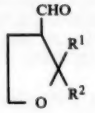
Filed Dec. 31, 1979, Ser. No. 108,308

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901644

Int. Cl.³ C07D *307/12, 307/24, 307/94*

U.S. Cl. 260—347.4 **7 Claims**

1. A process for the preparation of a tetrahydrofuran-3-aldehyde of the formula



in which

R^1 is hydrogen, or an alkyl or phenyl radical, and

R^2 is an alkyl, (C_1–C_4-alkoxy)-carbonyl, (C_{1-4}-alkoxy)-carbonylmethylene or phenyl radical, or

R^1 and R^2 together are an alkanediyl radical,

comprising heating a 4,5-dihydro-1,3-dioxepine of the formula

at about 100° to 250° C. in the presence of a catalytic amount of o-toluic acid.

4,292,247

PROCESS FOR PRODUCING ANTHRAQUINONE INTERMEDIATES

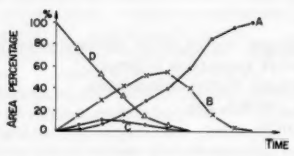
Masao Nishikuri, Hirakata; Akira Takeshita, Toyonaka, and Hirohito Kenmochi, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 21, 1978, Ser. No. 898,667

Claims priority, application Japan, Apr. 25, 1977, 52-48091; Apr. 26, 1977, 52-48839

Int. Cl.³ C07C *97/26, 97/25*

U.S. Cl. 260—381 **12 Claims**



1. A process for producing 1-amino-2-bromo-4-hydroxyanthraquinone, which comprises:

(1) dissolving 1-aminoanthraquinone in a concentrated sulfuric acid, the concentration of sulfuric acid being 90 to about 98% by weight,

(2) adding a brominating agent into the resulting solution at a temperature of 50° to 150° C.,

(3) stirring the mixture to convert 1-aminoanthraquinone into 1-amino-2, 4-dibromoanthraquinone at the same temperature as defined above,

(4) controlling the concentration of sulfuric acid in the reaction mixture to 95% by weight or more, and

(5) stirring the 1-amino-2, 4-dibromoanthraquinone-containing reaction mixture at a temperature of 100° to 140° C. in the presence of boric acid to convert 1-amino-2, 4-dibromoanthraquinone into 1-amino-2-bromo-4-hydroxyanthraquinone.

8. A process for producing 1-amino-2, 4-dibromoanthraquinone which comprises:

(1) dissolving 1-aminoanthraquinone in a concentrated sulfuric acid, the concentration of sulfuric acid being 90 to about 98% by weight,

(2) adding a brominating agent into the resulting solution at a temperature of 50° to 150° C., and

(3) stirring the mixture to convert 1-aminoanthraquinone into a 1-amino-2, 4-dibromoanthraquinone at the same temperature as defined above.

4,292,248

PREPARATION OF HYDROXYANTHRAQUINONES

William A. Michalowicz, Lock Haven, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 860,224, Dec. 13, 1977, abandoned. This application Jun. 6, 1979, Ser. No. 45,864

Int. Cl.³ C07C *50/18*

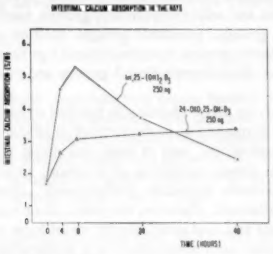
U.S. Cl. 260—383 **8 Claims**

1. A process for preparing a dihydroxyanthraquinone comprising reacting a dinitroanthraquinone with a metal salt selected from the group consisting of sodium formate and potassium formate at a molar ratio of metal salt to dinitroanthraquinone of at least 1.1 and in a reaction medium selected from the group consisting of dimethylformamide; dimethylacetamide; tetramethylurea; N-methylpyrrolidone; dimethylsulfoxide; tetramethylene sulfone; dimethylsulfone; N,N-dimethylmethylcarbamate and pyridine at a temperature of from 80° C. to 150° C. and separating the dihydroxyanthraquinone from the reaction system.

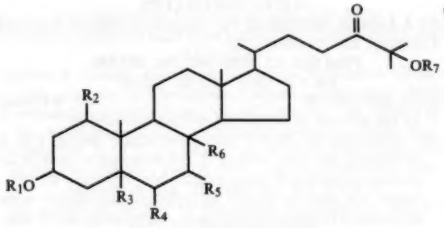
4,292,249
25-HYDROXY-24-OXOCHOLESTANE DERIVATIVES AND PREPARATION THEREOF

Osamu Nishikawa; Kenji Ishimaru, both of Iwakuni; Toru Takeshita, Hino, and Hideki Tsuruta, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 15, 1980, Ser. No. 121,857
Claims priority, application Japan, Feb. 15, 1979, 54-15420; May 4, 1979, 54-54154; Jun. 14, 1979, 54-73956; Jul. 26, 1979, 54-94183; Aug. 2, 1979, 54-98106
Int. Cl.[3] C07J 9/00
U.S. Cl. 260—397.2 16 Claims



1. A 25-hydroxy-24-oxocholestane derivative of the following formula (1)



(1)

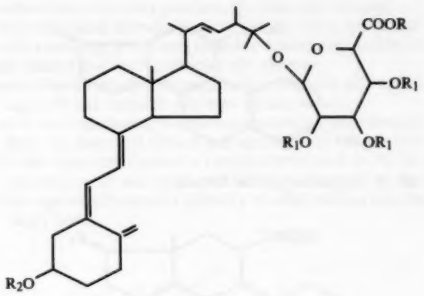
wherein R_1 is a hydrogen atom or a hydroxyl protective group; R_2 is a hydrogen atom, a hydroxy group or a protected hydroxy group; R_3 is a hydrogen atom, R_4 is a hydrogen atom, a hydroxy group or a protected hydroxy group; or R_3 and R_4, taken together may form a carbon-carbon bond; R_5 and R_6 are a hydrogen atom, or R_5 and R_6 may together form a carbon-carbon bond; R_7 is a hydrogen atom or a hydroxyl protective group.

4,292,250
VITAMIN D DERIVATIVES

Hector F. DeLuca; Heinrich K. Schnoes, and Leon W. LeVan, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 17, 1980, Ser. No. 207,169
Int. Cl.[3] C07J 9/00
U.S. Cl. 260—397.2 3 Claims

1. Compounds having the formula



where

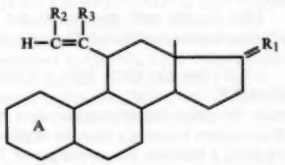
R is a hydrogen or methyl, R_1 is trimethylsilyl or acetyl and R_2 is hydrogen, trimethylsilyl or acetyl.

4,292,251
11β-SUBSTITUTED STEROIDS

Gerhard A. Overbeek, Nijmegen, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Jan. 31, 1978, Ser. No. 873,784
Claims priority, application Netherlands, Feb. 10, 1977, 7701384
Int. Cl.[3] C07J 1/00, 11/00
U.S. Cl. 260—397.3 29 Claims

1. A compound of the formula:

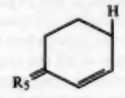


wherein:

(a) R_1 is O or (αY) (βZ), wherein Y is selected from the group consisting of H, unsaturated aliphatic hydrocarbons of two to about four carbon atoms, saturated aliphatic hydrocarbons of about one to about four carbon atoms, and Z is a free, esterified or etherified hydroxy group;

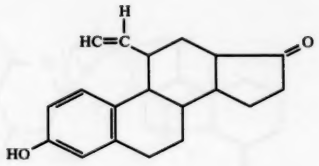
(b) R_2 is H and R_3 is H or CH_3; in the alternative, R_2 and R_3 together with their linking carbon atoms present form an acetylenic moiety of the formula HC≡C—; and

(c) ring A has the structure:

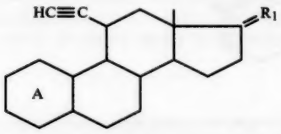


wherein R_5 is O or two hydrogens.

22. The compound



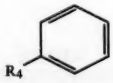
23. A compoound of the formula



wherein

(a) R_1 is O or (αY) (βZ), wherein Y is selected from the group consisting of H, unsaturated aliphatic hydrocarbons of two to about four carbon atoms, saturated aliphatic hydrocarbons of about one to about four carbon atoms, and Z is a free, esterified or etherified hydroxy group; and

(b) ring A has the structure:



wherein R_4 is a free, esterified or etherified hydroxyl group.

4,292,252

PROCESS FOR PREPARING ORGANOTIN ESTERS

John D. Collins, Albrighton, and Donald A. Wood, Warley, both of England, assignors to Tenneco Chemicals Inc., Saddle Brook, N.J.

Filed Jul. 27, 1979, Ser. No. 61,262

Claims priority, application United Kingdom, Jul. 28, 1978, 31575/78

Int. Cl.³ C07F 7/22

U.S. Cl. 260—429.7 **23 Claims**

1. A process for preparing organotin esters of carboxylic acids, which comprises reacting a base, an organotin halide of formula $(R^1)_aSnX_{4-a}$ wherein a is an integer of 1 or 2, X is a chlorine, bromine or iodine atom, and each of R^1 is an organic group, and a carboxyl compound containing at least one carboxylic acid group and at least one carboxylic ester group of formula $(R^2YOC)_mR^3(COOH)_n$ wherein m and n are each an integer of 1 to 3, R^3 is a single bond or an (m+n) - valent organic group, and Y is an oxygen or sulphur atom, and R^2 is as defined for R^1, the reaction being carried out in the presence of water and producing an organotin ester with at least one $OOCR^3COYR^2$ group attached to a tin atom, the amount of said base being to provide 0.9–1.3 equivalents per g. atom of halogen bonded to tin in the organotin halide, and the amount of said carboxyl compound being sufficient to replace at least 90% of the halogen atom in the organotin halide, the base, organotin halide and carboxyl compound being mixed in any order; provided, however, that when base is added progressively to a batch mixture of all the required organotin halide and all the required carboxyl compound, then at least some of the base is added to the organotin halide or to the carboxyl compound before all of the organotin halide and all of the carboxyl compound are admixed to form said mixture.

4,292,253

ORGANO-METAL CATALYSTS AND PROCESSES FOR THEIR PREPARATION

Geoffrey A. Ozin; Colin G. Francis, both of 63 Gormley Ave., Toronto, Ontario, and Helmut X. Huber, Apt. 1105, 627 W. Mall, Etobicoke, Ontario, all of Canada (M4V 1Y9)

Filed Apr. 3, 1979, Ser. No. 27,572

Int. Cl.³ C07F 7/28

U.S. Cl. 260—429.5 **16 Claims**

1. An organometallic liquid polymeric material comprising: an organic polymer which is a viscous liquid at a temperature in the range of −40° C. to +40° C. and is selected from the group consisting of polymers having carbon-carbon polymeric chains and silicone polymers, said polymer having functional groups therein and selected from aryl groups, naphthyl groups, phenanthryl groups, pyridinyl groups, olefinic unsaturation, cyclopentadienyl groups, cyclohexadienyl groups, cyclooctadienyl groups, dicyclopentadienyl groups and norbornadienyl groups;

and at least one metal chemically bonded to said polymer, in substantial quantities, in the form of small stable clusters of 2–13 metal atoms, said at least one metal being selected from the group consisting of titanium, zirconium, vanadium, niobium, tantalum, molybdenum, chromium, rhodium, palladium, platinum, tungsten, aluminum and silver;

said material and said small-cluster metal form therein being stable under inert atmosphere at a temperature within the range −40° C. to +40° C.

4,292,254

PREPARATION OF POLYISOCYANATES FROM POLYCARBAMATES

John J. Leonard, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 17, 1980, Ser. No. 197,848

Int. Cl.³ C07C 118/00, 125/07

U.S. Cl. 260—453 P **6 Claims**

1. In the process of producing polyisocyanates by

(a) condensing an alkyl-N-phenylcarbamate having 1 to 3 carbons in the alkyl moiety in the presence of an acid to produce condensate containing diphenylmethane dicarbamates and polymethylene polyphenyl carbamates with by-product N-benzyl compounds, rearranging said N-benzyl compounds in said condensate with acid catalyst to obtain a pyrolysis feed mixture containing diphenylmethane dicarbamates and polymethylene polyphenyl carbamates,

(b) thermally decomposing the carbamate moieties in the pyrolysis feed mixture to isocyanate moieties to produce polyisocyanates,

the improvement comprises increasing the percent isocyanate content of said polyisocyanates by prior to step (b) producing a solution by adding an organic cosolvent to the feed mixture, extracting that solution with an aqueous acid and removing the acid extract.

4,292,255

PROCESS FOR THE PREPARATION OF ORGANIC POLYISOCYANATES CONTAINING UREA GROUPS

Hans J. Hennig, Leverkusen; Peter Ziemek, and Erhard Schellmann, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 137,676, Apr. 7, 1980, which is a continuation of Ser. No. 3,576, Jan. 15, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,434

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803103

Int. Cl.³ C07C 119/042, 119/045, 119/048

U.S. Cl. 260—453 AR **7 Claims**

1. A process for the preparation of polyisocyanates containing urea groups comprising

(a) introducing an organic polyisocyanate of the formula

$$R_1(NCO)_2$$

wherein

R_1 is an aliphatic hydrocarbon group having from 2 to 18 carbon atoms, an aromatic hydrocarbon group having from 6 to 15 carbon atoms, an araliphatic hydrocarbon group having from 8 to 15 carbon atoms or a cycloaliphatic hydrocarbon group having from 4 to 15 carbon atoms, at least two carbon atoms in each hydrocarbon group being situated between the two isocyanate groups, into a reaction vessel, and

(b) injecting an organic polyamine of the formula

$$R_2(NH_2)_2$$

wherein

R_2 is an aliphatic hydrocarbon group having from 4 to 11 carbon atoms or an aromatic hydrocarbon group having from 6 to 15 carbon atoms, into the organic polyisocyanate in the reaction vessel at a pressure of from about 2 to 1000 bar through a straight jet nozzle having an internal diameter of from about 0.01 to 5 mm

wherein

(i) the polyisocyanate/polyamine NCO/NH_2 molar ratio is at least about 4:1, and

(ii) the temperature in the reaction vessel is between about 20° C. to 180° C.

4,292,256

N-[(PHOSPHINYL)AMINO]THIO- AND N-[(PHOSPHINOTHIOYL)AMINO]THIOMETHYLCARBAMATES

Stephen J. Nelson, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 962,266, Nov. 20, 1978, Pat. No. 4,208,409, which is a continuation-in-part of Ser. No. 874,959, Feb. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 765,807, Feb. 4, 1977, Pat. No. 4,081,536. This application Jan. 25, 1980, Ser. No. 115,474

The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.

Int. Cl.[3] **C07F** *9/15;* **A01N** *57/26;* **C07D** *339/06*

U.S. Cl. 260—937 **7 Claims**

1. 2-methyl-2-(methylthio)-O-[[[[(5,5-dimethyl-2-thioxo-1,3,2-dioxaphosphorinan-2-yl)(1-methylethyl)amino]methylamino]carbonyl]propanal oxime.

2. Syn and anti-O-[[[[cyclohexyl(5,5-dimethyl-2-thioxo-1,3,2-dioxaphosphorinan-2-yl)amino]thio]methylamino]carbonyl]-2-methyl-2-(methylthio)propanal oxime, m.p. 108°–115° C.

3. Methyl N-[[[[[cyclohexyl(5,5-dimethyl-2-oxo-1,3,2-phosphorinan-2-yl)amino]thio]methylamino]carbonyl]oxy]ethanimidothioate.

4. Methyl N-[[[methyl[[(1-methylethyl)2-oxo-1,3,2-dioxaphosphorinan-2-yl)amino]thio]amino]carbonyl]oxy]ethanimidothioate.

5. Methyl N-[[[[[(1,1-dimethylethyl)(5,5-dimethyl-2-oxo-1,3,2-dioxaphosphorinan-2-yl)amino]thio]methylamino]carbonyl]oxy]ethanimidothioate.

4,292,257

CARBURETOR AND VALVING THEREFOR

Lloyd L. Knowlton, P.O. Box 136, Walkerton, Ind. 46574

Filed Jan. 14, 1980, Ser. No. 112,024

Int. Cl.[3] **F02M** *11/10*

U.S. Cl. 261—37 **12 Claims**

1. A carburetor and valving therefor comprising:

a top plate;

a base plate;

a tubular housing having apertures in opposing walls thereof;

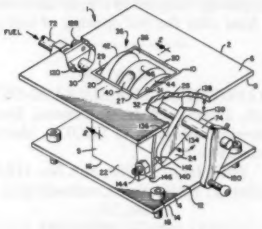
a roller valve rotatably positioned within said housing;

a bore extending through the axis of said valve, and a radially extending pre-mixing chamber intersecting said bore;

said roller valve having chordal ribs thereon;

a pair of rods extending through said apertures in said opposing walls and through said bore of said valve;

one of said rods having a small bore extending therethrough from the outer end thereof and opening into a larger bore at the inner end thereof, a rectangular cut-out in the circumference of said inner end having a flat wall surface through which extend a plurality of offset orifices into the larger bore;



the other of said rods having a reduced inner end, a rectangular slot cut in the circumference thereof and extending into a chamber within said reduced inner end, a knife-like edge on said slot, and a bore extending from the face of said reduced inner end opening into said chamber;

a fuel pressure regulator for said carburetor;

a metering valve for metering fuel to said pressure regulator, said metering valve operable by an armature of a solenoid, said solenoid operable from the ignition circuit of the engine; and

a fuel pump for providing fuel under pressure for said carburetor.

4,292,258

ALTITUDE COMPENSATING DEVICE FOR CARBURETORS

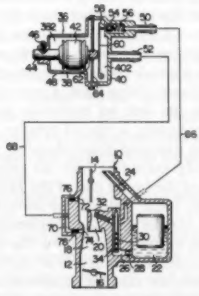
Shoichiro Sakurai, Hitachi, and Tadahiko Otani, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 22, 1980, Ser. No. 114,391

Claims priority, application Japan, Jan. 26, 1979, 54/7174

Int. Cl.[3] **F02M** *7/24*

U.S. Cl. 261—39 A **8 Claims**



1. An altitude compensating device for carburetors comprising:

(a) a partition plate disposed between first and second cas-

ings and for airtightly separating said casings from each other;

(b) a pressure-sensitive element disposed in a first chamber defined by said first casing and said partition plate, and an atmospheric air port formed in the wall of said first casing;

(c) an air metering valve disposed in a second chamber defined by said second casing and said partition plate and adapted to be driven by said pressure-sensitive element so as to have its metering area increased with the decrease of the atmospheric pressure;

(d) a first passage for communicating the downstream side of said air metering valve with a fuel passage through which fuel is delivered to the intake passage of said carburetor;

(e) a second passage for communicating said second chamber with a venturi portion formed between a choke valve and a throttle valve disposed in said intake passage; and

(f) a third passage adapted to supply air to said second chamber at least after the full opening of said choke valve.

4,292,259

ARRANGEMENT FOR SUCKING-OFF GASES

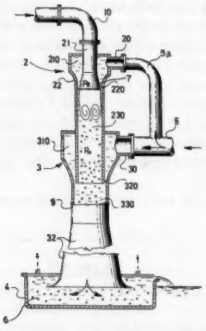
Zdenek Roth, Pilsen, and Josef Altmann, Domazlice, both of Czechoslovakia, assignors to SKODA, oborovy podnik, Pilsen, Czechoslovakia

Filed Jan. 28, 1980, Ser. No. 115,569

Claims priority, application Czechoslovakia, Feb. 12, 1979, 915-79

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—123 **3 Claims**



1. Arrangement for sucking-off air from an air-containing flowing fluid, comprising a first jet hydraulic pump having a first tubular body with an upper part constituting a first liquid chamber, conduit means supplying the first liquid chamber with liquid under pressure, a first air-containing fluid receiving and discharging conduit having a widened lower end disposed within the first liquid chamber with the outer edge of the widened lower end thereof spaced from the inner wall of the first liquid chamber to form a narrow annular gap therebetween acting as a nozzle to form a thorough, turbulent mixture of liquid and air-containing fluid, a second jet hydraulic pump disposed below the first jet hydraulic pump, the second jet hydraulic pump having a second tubular body with an upper part constituting a second liquid chamber, the lower end of the first tubular body extending into the second liquid chamber, the outer edge of the lower end of the first tubular body being spaced from the inner wall of the second liquid chamber to form a narrow annular gap therebetween, the second tubular body continuing downwardly below the end of the first tubular body and terminating at its lower end in a widened portion constituting a diffuser, conduit means for supplying the second liquid chamber with liquid under pressure, and an open-topped vessel within which the lower, diffuser-forming portion of the second tubular body is received, the vessel containing the mixture of air-containing fluid and the liquid forwarded thereto through the second tubular body to a level above the lower, diffuser-forming end of the second tubular body, air escaping from such mixture in the vessel to the atmosphere.

4,292,260

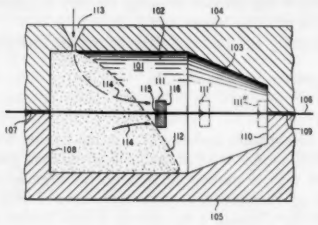
MOLDING OPTICAL FIBER CONNECTORS

Nim K. Cheung, Bayonne, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 22, 1980, Ser. No. 189,191

Int. Cl.³ B29D *11/00*

U.S. Cl. 264—1.5 **7 Claims**



2. An improved method of molding an optical fiber connector with a body portion (**601**) having a predetermined shape for mating comprising the steps of

inserting an optical fiber (**106**) through the mold cavity (**101**) from a first aperture (**107**) to a second aperture (**109**), said second aperture being disposed in a planar mold surface (**110**) defining a surface of said body portion; and

injecting filler material (**112**) into said mold cavity from one or more predetermined locations (**113**) to form said optical fiber connector, said improvement being CHARACTERIZED BY the steps of

inserting said optical fiber through an insert (**111**) having an aperture that slidingly receives said optical fiber, said insert having a flat surface substantially perpendicular to the insert aperture;

positioning said insert between said predetermined locations and said planar mold surface, the flat surface of said insert oriented toward said planar mold surface; and

causing said insert to slide along said fiber under the pressure of the injected filler material until said flat insert surface abuts said planar mold surface thereby straightening the optical fiber and controlling the position and angle of said optical fiber relative to said planar mold surface.

4,292,261

PRESSURE SENSITIVE CONDUCTOR AND METHOD OF MANUFACTURING THE SAME

Teizo Kotani; Kozo Arai; Shiomi Fukui, and Masaki Nagata, all of Yokohama, Japan, assignors to Japan Synthetic Rubber Company Limited, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 811,278

Claims priority, application Japan, Jun. 30, 1976, 51-77454; May 31, 1977, 52-63518

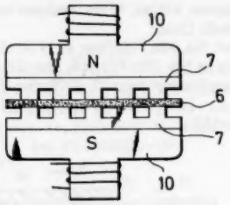
Int. Cl.³ B29C *25/00, 17/00*

U.S. Cl. 264—24 **15 Claims**

1. In a method for the manufacture of a pressure sensitive conductor comprising an insulating elastomer having dispersed therein from about 3% to 40% by volume based on the total volume of electrically conductive magnetic particles having a particle size of from 0.01 μm to 200 μm, the said particles being concentrated and distributed in portions of the conductor in accordance with a selected pattern in which those portions having a relatively high concentration of particles are high sensitivity conductor portions and other portions are insulator portions;

the improvement comprising first forming a mixture containing said elastomer and said particles, forming said

mixture into a sheet having a viscosity of from 10^4 to 10^7 poises at a strain rate of 10^{-1} sec.$^{-1}$, subjecting said sheet



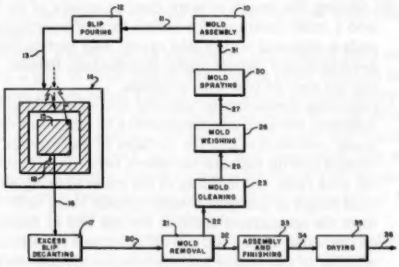
to the action of shaped magnets forming a magnetic field of a selected pattern, and thereafter curing said elastomer.

4,292,262

CERAMIC MATERIAL PROCESSING

Leo W. Tobin, Jr., Morehouse La., Darien, Conn. 06820

Filed Jun. 28, 1979, Ser. No. 52,874
Int. Cl.^{3} B28B *1/26*
U.S. Cl. 264—26 **3 Claims**



1. A method for producing ceramic ware from slip that contains water, comprising the steps of:

a. pouring the slip into an optimally moistened porous mold having a predetermined overall weight;

b. forming a green body within the mold by

i. a single application of microwave energy to the combination of the mold and slip to cake the slip at the mold surface and

ii. thereafter setting up the cake in ambient air without the application microwave energy;

c. decanting the excess slip from the mold;

d. removing the mold from the green body;

e. weighing the mold; and

f. adding moisture to the mold to obtain said predetermined overall weight whereby the mold is optimally moistened for reuse.

4,292,263

METHOD OF PRODUCING A FOAMED POLYURETHANE BODY-PROTECTING PAD

James R. Hanrahan, Fairfield, Conn., and Richard G. Levine, Lawrence, N.Y., assignors to Zimmer USA, Inc., Warsaw, Md.

Division of Ser. No. 774,377, Mar. 4, 1977, Pat. No. 4,193,134.
This application Aug. 27, 1979, Ser. No. 69,929
Int. Cl.^{3} B29D *27/04*
U.S. Cl. 264—46.9 **4 Claims**

1. The method of producing a body-protecting pad comprising:

stretching a hydrokinetic fabric sleeve over a male mold, the tautness of said stretched fabric sleeve being controlled to facilitate wetting and penetration of foam into the exterior of said fabric;

mixing a water-foamable hydrophilic polyurethane prepolymer and water in desired proportions in an open female pad mold of desired shape;

closing said molds; and

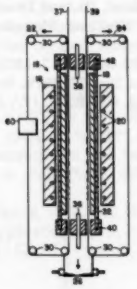
demolding the resulting, integrally molded pad and sleeve.

4,292,264

METHOD FOR PRODUCING POLYCRYSTALLINE RIBBON

Mario E. Cota, Scottsdale, and Richard W. Gurtler, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 925,734, Jul. 18, 1978, Pat. No. 4,250,148.
This application Jun. 30, 1980, Ser. No. 164,102
Int. Cl.^{3} B29C *13/04*
U.S. Cl. 264—81 **11 Claims**



1. A method for the substantially continuous formation of a silicon ribbon in a furnace heated at a desired temperature comprising the steps of: moving a plurality of elongated foil members through said furnace; positioning said plurality of elongated foil members so each forms a substantially plane wall bounding a reaction volume within said furnace; providing silicon bearing reactant vapor in said reaction volume for depositing silicon on said foil members at said desired temperature; and cooling said foil members to separate said silicon from said foil members.

4. A method for forming polycrystalline silicon ribbon comprising the steps of: moving a plurality of elongated foils through a tube positioned within a heated furnace; positioning said foils in said tube to surround a reaction volume, said foils forming substantially plane sides of said reaction volume; vapor sealing said tube to provide a controlled ambient within said tube while allowing the moving of said foils through said tube; injecting reactant vapor into said reaction volume, said reactant vapor depositing said polycrystalline silicon on said foils; and separating said polycrystalline silicon from said foil.

4,292,265

METHOD FOR PREPARING POROUS METAL HYDRIDE COMPACTS

Moshe Ron, Haifa, Israel; Dieter M. Gruen, Downers Grove, Ill.; Marshall H. Mendelsohn, Woodridge, Ill., and Irving Sheft, Oak Park, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 21, 1980, Ser. No. 113,873
Int. Cl.[3] C04B *15/14*
U.S. Cl. 264—82 10 Claims

1. A method for preparing a porous metallic-matrix hydride compact comprising:

forming a mixture of a finely divided, fully hydrided metal hydride and a finely divided matrix metal the matrix metal being an oxide-free, plastically deformable metal capable of binding the metal hydride, the mixture containing matrix metal in an amount sufficient to bind the metal hydride;

thoroughly dispersing the metal hydride and the matrix metal in each other to form an intimate mixture;

contacting the initimate mixture with a hydride poison to prevent the hydride from dehydriding at room temperature and atmospheric pressure; and

compressing the mixture of matrix metal and poisoned metal hydride at room temperature and at a pressure sufficient for the matrix metal to flow plastically to bend the metal hydride together while maintaining the mixture at a temperature below 90° C., thereby forming a porous metallic matrix hydride compact.

4,292,266

PROCESS FOR MAKING DECORATIVE GRASS

Erwin H. Weder, Highland, Ill., and Donald E. Weder, Hobart, Okla., assignors to Highland Manufacturing & Sales Co., Highland, Ill.

Division of Ser. No. 593,446, Jul. 7, 1975, Pat. No. 4,199,627.
This application Sep. 12, 1979, Ser. No. 74,750
Int. Cl.[3] B29C *17/14*
U.S. Cl. 264—140 3 Claims

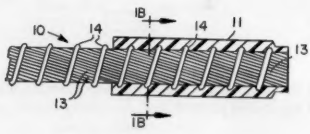
1. The process of making decorative grass consisting of the steps of passing flexible, thin, extruded, thermoplastic film strips through a slow speed godet, passing the strips through an oven, passing the strips through a high speed godet having a linear speed approximately 5 times the linear speed of the slow speed godet to stretch the heated strips and reduce their width approximately 2.5 times from about 125 mils to about 50 mils and reduce the thickness approximately 3.5 times from about 3.5 mils to about 1 mil, and chopping the stretched strips into predetermined lengths approximately 2 inches to 12 inches with the stretched cut-off strips having random longitudinal and transverse curls, and conveying the cut-off strips to an area for subsequent use as a lightweight cohesive mass of decorative grass.

4,292,267

METHOD FOR TERMINATING FLEXIBLE HELICAL WIRE CONDUIT

Charles E. Haynes, Adrian, Mich., assignor to ACCO Industries Inc., Trumbull, Conn.

Division of Ser. No. 956,975, Nov. 2, 1978, abandoned, which is a continuation of Ser. No. 761,215, Jan. 21, 1977, abandoned.
This application Aug. 27, 1979, Ser. No. 69,761
Int. Cl.[3] B29C *6/04, 17/14*
U.S. Cl. 264—157 3 Claims



1. The method of forming termination members on ends of helical wire conduits of the type comprising a helix of contiguous wires coiled with a relatively long pitch and an outer wire helix, comprising the steps of sequentially:

(a) providing a continuous length of a wire conduit;

(b) feeding the length of wire conduit axially of its length into a mold cavity until a secion thereof intermediate its ends is disposed within said cavity, said section having a predetermined cut-off point, intermediate thereof, defining the ends of two wire conduits;

(c) injecting thermoplastic material into said mold cavity at sufficient pressure and temperature to mold said material along said section and the surfaces of the exposed wires thereof and fill the external spaces between adjacent helical wire turns, the molding of the material being along an axial length of the wire conduit section being sufficient to form the termination member for one end of the conduit on one axial side of said cut-off point and the termination member of one end of a second conduit on the other axial side of said cut-off point;

(d) removing the molded section from said mold cavity;

(e) repeating the molding operation of steps (b), (c) and (d) at successive spaced sections along said wire conduit; and,

(f) cutting the wire conduit at said predetermined cut-off points into separate wire conduits.

4,292,268

LIQUID EPOXY MOLDING SYSTEM

George A. Salensky, Whitehouse Station, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,496
Int. Cl.[3] B29C *25/00*
U.S. Cl. 264—236 15 Claims

1. Method of injection molding of liquid epoxy resin compositions which comprises:

(A) Blending a mixture of:

(1) normally liquid epoxy resin having an epoxy equivalent of about 140 to about 225 grams per gram mole of oxirane oxygen;

(2) about 3 to about 15 parts by weight of an organic carboxylic acid containing at least 6 carbon atoms and at least one free carboxyl group;

(3) about 2 to about 250 parts by weight of a siliceous filler having a minimum surface area of 0.5 m^2/g.; and

(4) about 0 to about 30 parts by weight of a reactive diluent containing at least one 1,2-epoxy group;

with an approximately stoichiometric amount of a polyfunctional, primary or secondary amine used as a curing agent for liquid epoxy resins;

(B) injecting the resultant mixture at a temperature of about 25° C. to about 150° C. and a pressure of up to about 500 psig into a pressure mold; and

(C) retaining the mixture in said mold until hardened suffi-

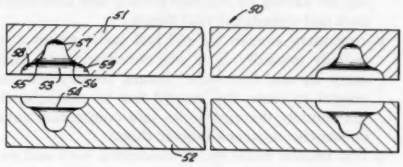
ciently so that the molded mixture can be ejected from the mold without distortion.

4,292,269

METHOD OF MANUFACTURING A RING SPRING FOR COMPOSITE MACHINERY SEALS

Jules M. Hock, 16056 Arbela Dr., Whittier, Calif. 90603

Filed Apr. 14, 1980, Ser. No. 140,302
Int. Cl.[3] B29F *1/00*
U.S. Cl. 264—299 4 Claims



1. A method for molding an elastomeric ring spring for use in an annular elastomeric boot of the U-cup type, comprising the steps of:

providing a mold having a generally ring-shaped mold cavity a pair of mold halves, the parting plane between said mold halves being a single plane which extends diametrically through said ring-shaped mold cavity so as to define, in each mold half an exposed annular cavity half therein, the surface defining each cavity half comprising first and second inwardly directed lobes extending at a 90° angle to each other from the inner corners of said cavity half, at 45° angles to said parting plane; and

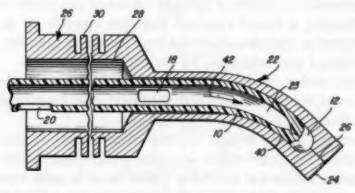
utilizing such mold to mold, in a generally conventional manner, a ring spring having a generally +-shape.

4,292,270

METHOD AND APPARATUS FOR MAKING COUDE CATHETERS

Richard E. Hannah, Spring Grove, and Steffen Lyons, Grayslake, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 22, 1979, Ser. No. 51,331
Int. Cl.[3] B29C *1/04*
U.S. Cl. 264—320 15 Claims



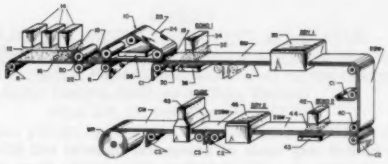
1. The method of making a elbowed-end catheter which comprises: inserting an end of a flexible, thermoplastic tube into the bore of a closed-end, hollow, tubular one piece die which defines the desired curve of the elbowed-end catheter; heating said tubular die to a temperature above the plastic melt temperature of said thermoplastic tube, while advancing said tube into the die, to cause at least 0.5 cm. of the tube end to collapse into a curved mass; cooling said die and tube to a temperature below said plastic melt temperature; and withdrawing said tube from the die.

4,292,271

METHODS OF APPLYING BONDING MATERIALS ONTO FIBROUS WEBS

James F. Buob, and Walter L. Pauls, both of Appleton, Wis., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 28, 1979, Ser. No. 108,022
Int. Cl.[3] B29J *5/00*
U.S. Cl. 264—518 33 Claims



1. A method of forming a dry-formed bonded fibrous web product, which comprises:

dispensing fibers from a distributor onto a foraminous forming surface to form a loose web surface,

applying a bonding material selected from the group consisting of binder solids-containing solutions and emulsions onto one side of the loose fibrous web to add to it from about 20% to about 40% by weight of the total binder solids to be included in the fibrous web product,

heating the solids-bearing loose fibrous web to at least partly dry it and form a once-bonded web,

applying a bonding material selected from the group consisting of binder solids-containing solutions and emulsions onto the other side of the once-bonded web to add to it the rest of the total binder solids to be included in the fibrous web product, and

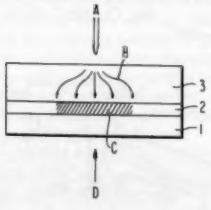
heating the web to thereby form a twice-bonded dry-formed cured fibrous web product, said first-applied bonding material having a greater binder solids concentration than said second-applied bonding material.

4,292,272

MULTILAYER ANALYSIS SHEET FOR ANALYZING LIQUID SAMPLES

Masao Kitajima; Fuminori Arai, and Asaji Kondo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 9, 1980, Ser. No. 157,737
Claims priority, application Japan, Jun. 8, 1979, 54-72047
Int. Cl.[3] G01N *21/84, 33/53, 33/50*
U.S. Cl. 422—57 16 Claims



1. A multilayer analysis sheet for analyzing liquid samples comprising, in sequence, a light transmitting water-impermeable support having on one side thereof at least one layer containing at least one reagent in a binder, and a liquid sample spreading layer made of fabric, said layers being laminated to form an intergral unit together with the support, and wherein said fabric has the ability to supply a liquid sample placed on the surface thereof to said reagent-containing layer at a substantially constant volume per unit area, which ability is conferred upon said fabric by rendering it hydrophilic.

4,292,273

RADIOIMMUNOASSAY PLATE

David E. Butz, Littleton, and Pasquale L. Pepicelli, Chelmsford, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Jun. 29, 1979, Ser. No. 53,260
Int. Cl.³ C12M *1/20*
U.S. Cl. 422—102 **8 Claims**

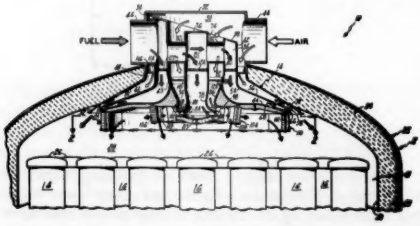
1. A radioimmunoassay plate comprising:
a bottom tray made of transparent material and having a plurality of wells extending downwardly from its top plane with the wells defined by downwardly tapered side walls and a bottom wall, said bottom walls lying in a common plane parallel to the top plane of the tray,
a peripheral side wall extending downwardly from the top plane and terminating at its lower edge above the plane of the bottom walls, whereby the bottom walls may all contact a planar surface on which the tray is placed without interference from the peripheral side walls,
each of said well bottom walls being flat at its central portion and having a substantial radius at the junction of the bottom and side wall equal to approximately half the radius of the bottom wall,
a removable cover for the bottom tray having a top wall which is adapted to closely overlie the top plane of the tray and having a skirt which engages and is supported by the peripheral side wall of the tray and forms a seal therewith when positioned to cover the tray and the wells in it,
an outwardly extending flange formed at the bottom of the peripheral side wall of the tray,
a seat formed in the cover for receiving the flange of a second bottom tray stacked on it to support the second tray on the cover,
and means provided in the cover for preventing a second bottom tray stacked on it from sliding sideways off the cover.

4,292,274

CATALYTIC REACTOR WITH IMPROVED BURNER

Joseph J. Faitani, Hartford; George W. Austin, Glastonbury; Terry J. Chase, Somers; George T. Suljak, Vernon, and Robert J. Misage, Manchester,all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 4, 1980, Ser. No. 175,226
Int. Cl.³ B01J *19/26*
U.S. Cl. 422—197 **3 Claims**



1. Catalytic reaction apparatus comprising:
A. a furnace having cylindrical, vertical wall means and top and bottom wall means in communication with said vertical wall means defining an enclosed space within said furnace;
B. a plurality of vertical, closely spaced, reaction tubes distributed substantially uniformly within said enclosed space and adapted to have catalyst disposed therein, said tubes each having an upper end, said upper ends being spaced below said top wall means of said furnace defining a combustion cavity in said enclosed space above said tube upper ends; and
C. burner means disposed in said furnace above said tube upper ends and including:
a. primary annular air and fuel outlet means disposed radially inwardly from said cylindrical wall means and constructed and arranged to cause the air and fuel to exit therefrom into said combustion cavity as concentric, adjacent annular sheets, including means for directing the exiting air and fuel toward said tube ends adjacent said cylindrical wall means;
b. secondary annular air and fuel outlet means disposed radially inwardly from and concentric with said primary air and fuel outlet means constructed and arranged to cause the air and fuel to exit substantially horizontally therefrom into said combustion cavity as concentric; adjacent annular sheets;
c. first annular baffle means concentric with said secondary air and fuel outlet means and disposed radially outwardly therefrom for deflecting a first portion of the fuel and air from said secondary outlet means downwardly toward said tube ends nearest the center of said furnace, said first baffle means including gaps therein permitting a second portion of the fuel and air from said secondary outlet means to pass horizontally therethrough; and
d. second annular baffle means concentric with and disposed radially outwardly from said first annular baffle means and constructed and arranged to deflect at least a portion of said second portion of the fuel and air downwardly toward said tube ends which are disposed between said tube ends adjacent said cylindrical wall means and said tube ends nearest the center of said furnace.

4,292,275

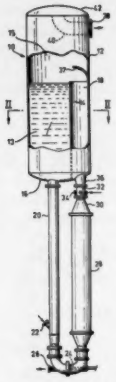
MODULAR CHLORINE DIOXIDE GENERATION SYSTEMS

James H. Forster, Mississauga, Canada, assignor to ERCO Industries Limited, Islington, Canada

Division of Ser. No. 45,850, Jun. 5, 1979, Pat. No. 4,251,502. This application May 22, 1980, Ser. No. 152,565
Claims priority, application United Kingdom, Jun. 28, 1978, 28105/78
Int. Cl.³ F28D *21/00*; B01J *19/00*
U.S. Cl. 422—198 **11 Claims**

1. A modular chlorine dioxide generation unit, comprising:
a generally cylindrical upright enclosed generator vessel for housing a liquid reaction medium capable of producing chlorine dioxide, chlorine and steam as gaseous product thereof and said solid by-product salt,
a first outlet means located in a lower end closure of said vessel for removing a slurry of said solid by-product salt in admixture with reaction medium,
a second outlet means located in an upper region of said vessel for removal of said gaseous product from a vapor space above the intended liquid level in said vessel,
means within said generator vessel defining a fluid flow path from an inlet means located in said lower end closure of said vessel to a location above the intended liquid level in said generator which is out of direct fluid flow relationship with said reaction medium within said vessel,
means defining a recycle flow path from said first outlet means to said inlet means, said recycle flow path means including pump means for pumping liquor around said recycle flow path, heat exchanger means for heating recycling liquor to the boiling temperature of the reaction medium under an applied subatmospheric pressure, first frusto-conical pipe means located downstream of said

pump means and said heat exchanger means and having a decreasing cross-sectional dimension in the direction of liquid flow for exerting a back pressure on said recycling liquor to prevent boiling of the same in said recycle flow path upstream of said first frusto-conical pipe means, collar pipe means located downstream of said first frusto-conical pipe means and having acid inlet means for injection of strong mineral acid reactant into liquor passing



through said collar pipe means and second frusto-conical pipe means located downstream of said collar pipe means and immediately upstream of said generator vessel inlet and having an increasing cross-sectional dimension in the direction of fluid flow to permit expansion of gases at low acceleration, and

means for feeding alkali metal chlorate reactant to said recycle flow path.

4,292,276

APPARATUS FOR PRODUCING SILICON CARBIDE

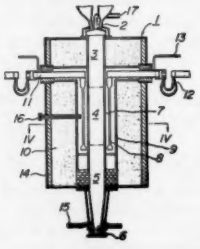
Ryo Enomoto, Ohgaki; Mitihiro Yoshioka, Yoro, and Takao Yokoyama, Ohgaki, all of Japan, assignors to Ibigawa Electric Industry Co., Ltd., Ohgaki, Japan

Division of Ser. No. 797,609, May 16, 1977, Pat. No. 4,162,167. This application Mar. 9, 1979, Ser. No. 18,939

Claims priority, application Japan, May 24, 1976, 51-60501; May 26, 1976, 51-61432

Int. Cl.[3] C01D *1/32*; H05B *7/18*

U.S. Cl. 422—199 **2 Claims**



1. An apparatus for producing silicon carbide consisting mainly of β-type crystal, comprising a gravity-feed reaction vessel having an inlet for a starting material, a preheating zone, a heating zone, a cooling zone and a closeable outlet for a product in this order, and a heating means for the starting material in the heating zone by an electrically indirect heating; said heating zone being made of a graphite cylinder and having an effective heating width of 0.10–0.35 m; and further comprising a heat insulating layer for said heating zone, said layer composed of fine powder selected from the group consisting of carbon, graphite and mixtures thereof;

wherein said heating means is composed of one or more graphite heating elements vertically arranged outside said graphite cylinder, and a graphite reflective cylinder arranged near the outside of said heating elements and inside said heat insulating layer.

4,292,277

LIQUID-LIQUID CONTACTING APPARATUS

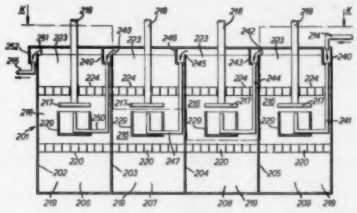
Christopher F. Bonney, Yarm, and George A. Rowden, Stockton-on-Tees, both of England, assignors to Davy McKee (Minerals & Metals) Limited, Stockton-on-Tees, England

Filed Jul. 11, 1980, Ser. No. 167,473

Claims priority, application United Kingdom, Jul. 20, 1979, 25385/79

Int. Cl.[3] B01D *11/04*

U.S. Cl. 422—259 **10 Claims**



1. Apparatus for effecting liquid-liquid contact in a plurality of stages between an aqueous liquid medium and an organic hydrophobic liquid medium capable of undergoing mass transfer with the aqueous liquid medium, comprising:

a first mixer-settler;

a second mixer-settler adjacent the first mixer-settler and sharing a common wall therewith;

each mixer-settler comprising:

a mixing chamber;

agitator means in the mixing chamber for mixing the aqueous and organic hydrophobic liquid media so as to form a dispersion of globules of one medium dispersed in the other, which globules are of a size such that, upon standing under gravity, the dispersion is capable of disengaging substantially completely into two separate layers;

an upper settling chamber above the mixing chamber;

a lower settling chamber below the mixing chamber; and

upper and lower baffle means extending across the mixer-settler so as to divide the mixing chamber from the upper settling chamber and the lower settling chamber respectively, each baffle means being adapted to provide a plurality of flow paths for liquid between the mixing chamber and the respective settling chamber and to permit maintenance in the respective settling chamber of conditions favouring dispersion disengagement despite turbulent mixing conditions in the mixing chamber;

means for supplying the heavier medium of the two to the mixing chamber of the first mixer-settler;

means for removing disengaged heavier medium from the lower settling chamber of the second mixer-settler;

means for supplying the lighter medium of the two to the mixing chamber of one of the first and second mixer-settlers;

means for removing disengaged lighter medium from the upper settling chamber of the other one of the first and second mixer-settlers;

weir means in the flow path of lighter medium between the first and second mixer-settlers and having a length which exceeds half the length of the common wall, over which weir means disengaged lighter medium from the upper settling chamber of the said one mixer-settler may overflow;

first conduit means for passing disengaged lighter medium that

overflows the weir means from the said one mixer-settler to the mixing chamber of the said other mixer-settler; and

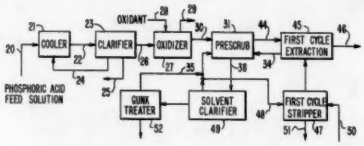
second conduit means for passing disengaged heavier medium from the lower settling chamber of the first mixer-settler to the mixing chamber of the second mixer-settler.

4,292,278

PURIFICATION OF WET PROCESS PHOSPHORIC ACID AS A PRETREATMENT STEP IN THE RECOVERY OF URANIUM

Leonard Elikan; Regis R. Stana, and Robert W. Ritchey, all of Lakeland, Fla., assignors to Wyoming Mineral Corp., Lakewood, Colo.

Filed Feb. 21, 1979, Ser. No. 13,700
Int. Cl.³ C01B *25/235*
U.S. Cl. 423—8 **7 Claims**



1. A method of removal of humic acid impurities from a metal containing acidic solution also containing humic acid impurities, as a pretreatment in a metal recovery process, comprising the steps of:

(1) mixing the humic acid containing acidic solution with a scrubbing agent in a mixer-settler means, the scrubbing agent consisting essentially of:

(a) an organic, metal extractant material that has low solubility in the acidic solution, and is effective to form a metal derivative with metal ions in the acidic solution, and

(b) an organic hydrocarbon solvent for the metal extract material, said hydrocarbon solvent having a boiling point of over about 70° C., a limited solubility in the acidic solution, and comprising from about 50 vol. % to about 90 vol. % of the scrubbing agent, where the scrubbing agent is interactive with the humic acid impurities, and is added in an amount effective to scrub the humic acid impurities from the acidic solution; where after mixing, the acid and scrubbing agent flow at a high rate into the settler, forming a mixture consisting of a scrubbing agent-impurities sludge phase and a purified acidic solution phase, where the sludge phase forms on top of the purified acidic solution phase, where the flow rate of the mixed acid and scrubbing agent into the settler is such that the thickness ratio of the top sludge phase:bottom purified acidic phase is maintained at from about 1:2 to 10,

(2) removing the scrubbing agent-impurities sludge phase, and then

(3) passing the purified acidic solution phase into a metal extraction means.

4,292,279

PRODUCTION OF HIGH PURITY URANIUM COMPOUNDS FROM CRUDE YELLOW CAKE

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Apr. 19, 1979, Ser. No. 31,655
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—15 **8 Claims**

1. A process for the production of high purity uranium salts from crude yellow cake which comprises the steps of:

(a) dissolving of crude yellow cake with an effective amount of aqueous mineral acid selected from sulfuric, hydrochloric, nitric, and phosphoric acids, thereby forming an aqueous acidic solution containing dissolved uranium,

(b) adding, to the said acidic solution containing dissolved uranium, sufficient ammonium uranyl tricarbonate-forming components to thereby substantially convert the uranium in said acidic solution to ammonium uranyl tricarbonate, wherein said ammonium uranyl tricarbonate forming materials are selected from ammonia, carbon dioxide, ammonium carbonate, ammonium carbamate, carbamic acid, ammonium bicarbonate, and mixtures of these,

(c) treating said solution containing ammonium uranyl tricarbonate with a water-soluble organic lower alcohol or ketone in amounts and under conditions effective to precipitate said ammonium uranyl tricarbonate, and

(d) separating said precipitated ammonium uranyl tricarbonate as a solid ammonium uranyl tricarbonate leaving an aqueous filtrate.

4,292,280

SEPARATION OF ANIONIC METAL COMPLEXES BY OXYGEN CONTAINING POLYMERS

Bertus van Engelenburg, and Hendrik F. van Wijk, both of Zeist, Netherlands, assignors to Nederlandse Centrale Organisatie voor Toegepastnatuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Feb. 5, 1979, Ser. No. 9,454
Claims priority, application Netherlands, Feb. 9, 1978, 7801516
Int. Cl.³ C01G *9/04, 3/05, 53/09*
U.S. Cl. 423—24 **8 Claims**

1. A process for the separation of iron and zinc from a mixture of iron, zinc, and copper, which comprises the steps of:

(a) dissolving the mixture of iron, zinc, and copper in 6 M hydrochloric acid solution;

(b) contacting the solution from step (a) with a solid, insoluble polymer containing oxygen bonded to carbon to cause chloride complexes of iron III to bond to the polymer;

(c) recovering iron-free solution;

(d) recovering iron III chloride by contacting the polymer from step (b) with water;

(e) adjusting the iron-free solution from step (c) to comprise 8 M hydrochloric solution;

(f) contacting the solution from step (e) with the polymer to cause zinc chloride complexes to bind to the polymer;

(g) recovering iron-free and zinc-free, copper chloride solution; and

(h) recovering zinc chloride by contacting the polymer from step (f) with water.

5. A process for the separation of iron III, cobalt II, and nickel II from a mixture thereof, which comprises the steps of:

(a) dissolving the mixture of metals in a 2 M potassium thiocyanate medium;

(b) adjusting the solution from step (a) to 0.5 M of hydrochloric acid;

(c) containing the solution from step (b) with a solid, insoluble polymer containing oxygen bonded to carbon to cause chloride complexes of iron III, cobalt II, and nickel II, respectively, to bond to the polymer; and

(d) rinsing the polymer in step (c) in several steps with water or 0.01 M potassium thiocyanate to respectively recover nickel II, cobalt II, and iron III.

4,292,281

SELECTIVE LEACHING OF CHLORIDE FROM COPPER OXIDE MINERALS

Dennis D. Chilcote, Hibbing, and Donald J. Kaczyski, Pengilly, both of Minn., assignors to The Hanna Mining Company, Cleveland, Ohio

Filed Jul. 15, 1980, Ser. No. 169,179
Int. Cl.³ C01G *3/02*
U.S. Cl. 423—27 **30 Claims**

1. A method for extracting chloride for copper-hydroxy-chloride containing copper oxide ore comprising the steps of

(a) contacting said ore with an aqueous solution of the basic salt of a Group I-A Group II-A metal in a leaching stage to extract chloride ions from said ore and dissolve said

chloride ions in said solution, said salt including an anionic portion with a valence of minus one or minus two, the molar ratio of said anionic portion to the chloride ions in said ore being in the range of about 5:1 to about 1:1 when the valence of said ionic portion is minus one and about 5:2 to about 1:2 when the valence of said ionic portion is minus two;

(b) removing part of said solution from the mixture of ore and solution as a bleed stream for chloride disposal; and

(c) separating said ore from the remainder of said solution.

4,292,282

PROCESS FOR RECOVERING METALS FROM CATALYSTS FOR THE HYDRODESULFURIZATION OF HYDROCARBONS

Jay Y. Welsh, Catonsville, Md.; Pierre C. Picquet, and Pierre D. Schyns, both of Mons, Belgium, assignors to Societe Europeenne des Derives du Manganese, en abrege Sedema Societe Anonyme, Brussels, Belgium

Filed Apr. 7, 1980, Ser. No. 137,695

Claims priority, application France, Apr. 9, 1979, 79 08940

Int. Cl.³ C01G *39/04, 31/04;* C01F *7/56*

U.S. Cl. 423—60 **17 Claims**

1. A process for recovering molybdenum, vanadium an aluminum metal values from residues of hydrodesulfurization catalysts from which catalysts the residual hydrocarbons have been removed, comprising chlorinating said residues of hydrodesulfurization catalysts using a mixture of gaseous chlorine, hydrogen chloride and water vapor at a temperature of from about 200° C. to about 400° C., whereby the molybdenum and vanadium are volatilized as oxychlorides and aluminum is volatilized as chloride, and absorbing said volatilized oxychlorides and chloride at a temperature between about 20° C. and about 70° C. into an aqueous medium containing hydrochloric acid.

4,292,283

METHOD FOR THE RECOVERY OF ZINC

Horst Weigel, Cologne, Fed. Rep. of Germany, and Jorge Lema-Patino, La Paz, Bolivia, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 846,160

Int. Cl.³ C01G *9/06;* C22B *5/16*

U.S. Cl. 423—107 **3 Claims**

1. In a method for the recovery of zinc from zinc ores or concentrates in which said ores or concentrates are subjected to a primary leaching resulting in a leaching residue having a relatively high content of undissolved zinc and other metals, the residue is dried, suspended in hot gases under reducing conditions resulting in the volatilization of volatilizable zinc compounds and compounds of said other metals which are subsequently precipatated as mixed oxides, and oxide mixtures from pyrometallurgical treatment are subjected to a secondary leaching in a weakly acidic solution, the improvement which comprises:

recycling the mixed oxides to said primary leaching step, then through said volatilization step and then into said secondary leaching.

4,292,284

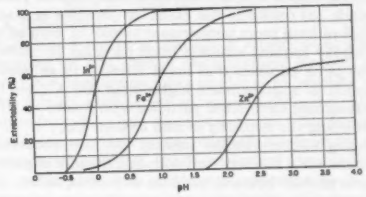
SOLVENT EXTRACTION RECOVERY PROCESS FOR INDIUM

Keishi Tomii, Funabashi, and Hideyuki Tsuchida, Annaka, both of Japan, assignors to Toho Aen Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1980, Ser. No. 153,271

Int. Cl.³ C01G *15/00*

U.S. Cl. 423—112 **6 Claims**



1. A process of recovering indium, comprising the steps of adjusting the pH of an aqueous solution containing indium ions to 0.25–4.5, bringing the aqueous solution into contact with an organic solvent solution prepared by diluting an extracting reagent containing a monoalkylphosphoric acid and/or a dialkylphosphoric acid and a trialkylphosphoric acid in 1:2–5 by volume ratio with a phase-stabilizing water-immiscible organic solvent to extract the indium ions in the organic solvent solution and then bringing the organic solvent solution into contact with an aqueous sulfuric acid-acidic solution containing 100–500 g/liter free sulfuric acid to back-extract the indium ions into the aqueous sulfuric acid-acidic solution to provide an indium concentrate.

4,292,285

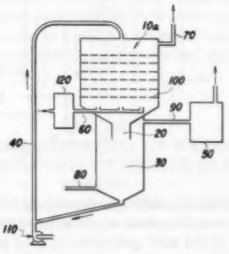
METHOD FOR REMOVING COMPOUNDS WITH OFFENSIVE ODOR FROM A GAS CONTAINING THE SAME

Masaaki Nakao, Kunitachi, and Zenya Shiiki, Narashino, both of Japan, assignors to Taiyo Kaken Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 854,063, Nov. 22, 1977, abandoned. This application Dec. 10, 1979, Ser. No. 101,435

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—210 **8 Claims**



1. In the method of removing basic compounds and other compounds with offensive odor from a large amount of a flowing exhaust gas containing the same at a low concentration by bringing said gas into contact with particles of activated carbon, the improvement comprising:

using a mixture of (1) particles of activated carbon having a value of compression strength of 500 to 1,500 g/cm² and (2) particles of porous carbon impregnated with an amount of 1–50% by weight of phosphoric acid or ammo-

nium phosphate or mixtures thereof, said particles of activated carbon being prepared by (a) mixing a pitch of softening point of 50° to 350° C., of a carbon content of 80 to 97%, of a ratio of hydrogen to carbon of 0.3 to 2.5 and of a nitrobenzene-insoluble fraction of less than 60% by weight with at least one aromatic hydrocarbon, (b) forming the mixture into substantially spherical particulate shape, (c) immersing the thus formed spherical particles into a solvent in which said pitch is hardly soluble but said aromatic hydrocarbon is easily soluble thereby extracting said aromatic hydrocarbon from said spherical particles of pitch, (d) oxidizing the extracted particles at a temperature of from room temperature to 400° C. with an oxidant thereby forming infusible pitch particles, (e) carbonizing the pitch particles thus made infusible in an inert atmosphere at a temperature higher than 600° C., and (f) activating said carbonized particles with steam;

controlling the humidity of said exhaust gas;

bringing said controlled exhaust gas into countercurrent contact in a fluidized bed with said mixture of particles of activated carbon and particles of porous carbon impregnated with phosphoric acid or ammonium phosphate or mixtures thereof at a temperature of lower than 100° C. thereby removing from said exhaust gas said compounds with offensive odor;

heating said mixture after said countercurrent contact with said exhaust gas together with steam thereby expelling said compounds with offensive odor as condensed gaseous matter from said mixture and also regenerating the adsorbing capability of said mixture of particles; and

recycling the thus regenerated mixture into said step of countercurrent contact.

4,292,286

PROCESS FOR SELECTIVE REMOVAL OF CYCLIC UREA FROM HINDERED AMINE GAS TREATING SOLUTION

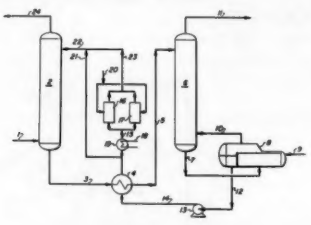
Geoffrey R. Say; James R. Hays, Sr., both of Baton Rouge, La., and Jagannathan N. Iyengar, Rockaway, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 972,500, Dec. 22, 1978, Pat. No. 4,180,548. This application Dec. 11, 1979, Ser. No. 102,611

The portion of the term of this patent subsequent to Dec. 25, 1996, has been disclaimed.

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—223 **8 Claims**

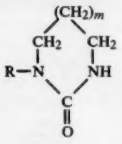


1. An acid gas scrubbing process providing for the selective removal of a cyclic urea reaction product which forms as a by-product of the acid gas removal, said process comprising:

a. contacting an acid gas mixture with an aqueous solution in an absorption zone, said aqueous solution comprising a basic alkali salt, or metal hydroxide selected from the group consisting of alkali metal bicarbonates, carbonates, hydroxides, borates, phosphates and their mixtures, and an activator for said basic salt comprising at least one sterically hindered amine having the generic formula:

$$R—NH—(CH_2)_m—NH_2$$

where R is a secondary or tertiary alkyl or cycloalkyl hydrocarbon having 4–20 carbon atoms and m is 2–5, at elevated temperatures and pressures such that there is formed a cyclic urea reaction product having the formula:



where R is a secondary or tertiary alkyl or cycloalkyl hydrocarbon having 4–20 carbon atoms and m is 0–3;

b. passing said acid gas rich aqueous solution to a regeneration zone where it is contacted with steam to remove the acid gas impurities therefrom;

c. cooling a portion of the lean solution exiting from said regeneration zone to a temperature ranging from 180°–80° F. to selectively precipitate the cyclic urea from said lean solution;

d. passing said lean solution containing said precipitated cyclic urea to a separation zone to remove at least a portion of the cyclic urea from said lean solution.

4,292,287

METHOD FOR DIRECTLY RECOVERING FLUORINE FROM GAS STREAMS

Michael J. Orlett, Portsmouth, and Anthony J. Saraceno, Waverly, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 24, 1980, Ser. No. 143,246

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—241 **13 Claims**

1. A process for the removal of gaseous fluorine from a gas stream containing the same, said process comprising:

directing said stream through a bed of sintered anhydrous K_3NiF_6 pellets at a temperature effecting fluorination of said pellets to K_3NiF_7.

6. A process for the removal of gaseous fluorine from a gas stream containing the same, comprising:

contacting said stream with anhydrous K_3NiF_6 pellets, said pellets having been prepared by the steps of:

(a) providing a 3:1 mole-ratio powder mixture of potassium fluoride and hydrated nickel fluoride,

(b) contacting said mixture with finely divided water at a temperature effecting conversion of said mixture to agglomerates of hydrated K_3NiF_5,

(c) heating the agglomerates to a temperature effecting sintering but not fusion thereof to form sintered pellets of anhydrous K_3NiF_5, and

(d) reacting said pellets with gaseous fluorine to convert them to K_3NiF_6.

4,292,288

CATALYST FOR CO REMOVAL FROM FLUE GAS

Elroy M. Gladrow, East Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 18, 1977, Ser. No. 843,277

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—247 **4 Claims**

1. A process for reducing the level of CO in the effluent flue gas from the regeneration of a cracking catalyst which comprises contacting said regenerator effluent flue gas with a spent noble metal-containing reforming catalyst at temperatures ranging from 1000° F. to 1350° F. to oxidize CO to CO_2, said catalyst comprising from 0.1 to 1.0% of platinum, palladium, iridium, rhodium, rhenium or mixtures thereof.

4,292,289

PROCESS FOR PRODUCING HYDROGEN FLUORIDE AND PHOSPHORIC ACID

Curtis W. Cannon, San Diego, Calif., and Robert N. Hall, Boulder, Colo., assignors to Climax Chemical Company, Hobbs, N. Mex.

Continuation-in-part of Ser. No. 987, Jan. 4, 1979, Pat. No. 4,202,867, which is a continuation-in-part of Ser. No. 939,958, Sep. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 828,925, Aug. 29, 1977, abandoned. This application Feb. 14, 1980, Ser. No. 121,486

Int. Cl.³ C01B *25/10, 25/16*

U.S. Cl. 423—301 16 Claims

1. A process for producing hydrogen fluoride from fluoride bearing ores comprising

contacting a fluoride and a phosphate bearing raw material with fluorosulfonic acid to release hydrogen fluoride and volatile phosphorous compounds,

separating said hydrogen fluoride and said volatile phosphorous compounds from the excess fluorosulfonic acid and residual matter,

separating said hydrogen fluoride from said volatile phosphorous compounds and recovering same.

4,292,290

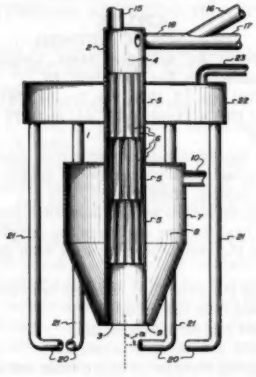
PROCESS FOR THE PRODUCTION OF FINELY-DIVIDED METAL AND METALLOID OXIDES

Donald E. Tunison, III, Savoy, Ill., assignor to Cabot Corporation, Boston, Mass.

Filed Apr. 16, 1980, Ser. No. 140,856

Int. Cl.³ C01B *33/18, 13/14*

U.S. Cl. 423—336 13 Claims



1. In a process for the production of finely-divided particulate metal and metalloid oxides comprising mixing, within a burner means, a vaporous or gaseous metal or metalloid halide, or mixture thereof, with a hydrogen-containing water-producing fuel and an oxidant therefor; projecting the resulting reactant mixture as a continuous stream from the mouth of said burner means into a reaction space; continuously discharging a purge gas at a fouling preventive rate along the boundary of said reactant mixture stream in the region of the burner mouth and continuously combusting the reactant mixture stream within said reaction space to produce said finely-divided particulate oxide therein; the improvement which comprises: substantially tangentially contacting the periphery of said reactant mixture stream, at a plane substantially normal thereto and spaced downstream from said burner mouth, with a plurality of continuous pilot flames.

4,292,291

PROCESS FOR THE PRODUCTION OF FURNACE BLACK

Lothar Rothbuhr, Hermulheim, and Josef Witte, Bruhl, both of Fed. Rep. of Germany, assignors to Deutsche Gold- Und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jun. 15, 1979, Ser. No. 48,770

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827872

Int. Cl.³ C01B *31/02;* C09C *1/48*

U.S. Cl. 423—450 11 Claims

1. In a process for the production of furnace black comprising spraying an oily carbon black forming material into a stream of hot combustion gases produced by reaction of fuel with reaction air, chilling and recovery of the carbon black by separation from the waste gases during which the reaction air is heated by means of the waste gases separate from the carbon black conducting conduit, the improvement comprising burning the waste gases in a combustion apparatus by means of secondary air in an amount to provide an oxygen excess over that required to burn the waste gases in order to heat the reaction air to a temperature between 600° and 1,250° C., and then introducing the thus heated reaction air into the process.

4,292,292

CHLORINE DIOXIDE GENERATION PROCESS

Bruce W. Hicks, Rio Linda, and Jerry D. Hicks, Sacramento, both of Calif., assignors to Rio Linda Chemical Company, Rio Linda, Calif.

Filed May 30, 1980, Ser. No. 154,831

Int. Cl.³ C01B *11/02*

U.S. Cl. 423—477 5 Claims

1. A continuous process for producing chlorine dioxide by the reaction of a chlorite in a strong hydrochloric acid solution which comprises: Maintaining a constant level in a single reactor, in the absence of dilution water, by continuously feeding an undiluted solution of sodium chlorite that is from 0.7 molar to 3.49 molar into the reactor, and continuously feeding an undiluted hydrochloric acid solution that is from 6 molar to 12 molar into the reactor wherein from 0.8 moles to 2 moles of hydrochloric acid is supplied per mole of sodium chlorite, continuously removing the excess solution containing the generated chlorine dioxide from the reactor.

5. A process for producing chlorine dioxide by the reaction of a chlorite in a strong hydrochloric acid solution which comprises:

reacting in the absence of dilution water an undiluted solution of sodium chlorite that is from 0.7 molar to 3.49 molar with an undiluted hydrochloric acid solution that is from 6 molar to 12 molar in a reactor wherein from 0.8 moles to 2 moles of hydrochloric acid is supplied per mole of sodium chlorite.

4,292,293

METHOD FOR THE OXIDATION OF WATER-SOLUBLE SULFIDE COMPOUNDS TO HIGHER OXIDATION STATES

Donald A. Johnson, Bolingbrook, and Baker N. Nimry, Downers Grove, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 28, 1980, Ser. No. 172,608

Int. Cl.³ C02F *1/76;* C01B *17/06*

U.S. Cl. 423—571 11 Claims

1. An improved method for the oxidation of water-soluble inorganic sulfide ions found in aqueous systems to higher oxidation states which method utilizes a metallic ion catalyst selected from the group consisting of nickel, cobalt, magnesium, copper and iron in the presence of an oxidizing agent selected from the group consisting of oxygen, hydrogen peroxide and chlorine, the improvement comprising adding to the aqueous system a water-soluble anionically charged polymer

having a molecular weight of from 1,000–100,000 in an effective amount to improve the efficiency of the metallic ion catalyst.

4,292,294

YELLOW PIGMENTS STABLE AT HIGH TEMPERATURES

Arvind S. Patil, Grosse Ile, Mich., and Lowell E. Netherton, Summit, N.J., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 37,567, May 9, 1979, abandoned. This application Jan. 25, 1980, Ser. No. 115,309

Int. Cl.³ C01G *41/00*

U.S. Cl. 423—594 **10 Claims**

1. A transparent, temperature-stable spinel in the form of acicular particles having a length of 0.01 to 0.13 microns and consisting essentially of oxygen, iron, and at least one other metal, said spinel corresponding to the formula

$$XFe_2O_4$$

wherein X is said other metal, said other metal being one selected from the group consisting of magnesium, zinc and tin.

5. A method of making a transparent yellow pigment having good stability at high temperatures, said method consisting essentially of the steps of

forming a first aqueous solution consisting essentially of water, a soluble ferrous salt, and at least one other salt, said salt being a soluble salt of a non-ferrous metal selected from the group consisting of magnesium, zinc, and tin, said ferrous salt and said non-ferrous salt being present in said solution in proportions such that the respective quantities of iron and other metal which are present will yield, when said solution is so adjusted in pH as to cause precipitation, the formation of a substantial quantity of a precipitate oxidizable to a spinel of the formula XFe_2O_4, in which X is a metal selected from the group consisting of magnesium, zinc, and tin

mixing with said first aqueous solution a second aqueous solution to form a reaction mixture, said second solution containing a substantial proportion of a soluble alkalizing compound selected from the group consisting of the carbonates, bicarbonates, and hydroxides of the alkali metals, the said second solution being used in such quantity and the said first and second solutions being in such a state of dilution that there results upon said mixing the formation of a precipitate in the form of particles of sub-micron size, the liquid phase of said reaction mixture being as a result of such precipitation substantially completely depleted in its content of metal ions having a valence greater than one;

oxidizing at 15° to 35° C. the said precipitate to form a spinel in aqueous solution;

then heating said aqueous solution having said spinel therein to a temperature of from about 75° to 100° C.; and

recovering said spinel.

4,292,295

HIGHLY REACTIVE ALUMINA AND PROCESS FOR THE PREPARATION THEREOF

Michel Pajot, and Laurent Seigneurin, both of Salindres, France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 51,172, Jun. 22, 1979, abandoned. This application Aug. 1, 1980, Ser. No. 174,659

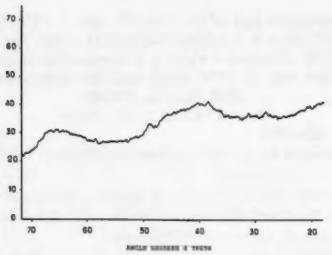
Claims priority, application France, Jul. 26, 1978, 78 22095

Int. Cl.³ C01F *7/30, 7/02*

U.S. Cl. 423—625 **4 Claims**

1. Highly reactive aluminum oxide (Al_2O_3) containing no more than about 10% water, said aluminum oxide having an amorphous structure and a specific surface of greater than about 600 m^2/g and the X-ray diffraction pattern of FIG. 1.

2. A process of preparing highly reactive aluminum oxide (Al_2O_3), having an amorphous structure and a specific surface of greater than about 600 m^2/g., comprising thermally decomposing the double carbonate of aluminum and ammonium of the formula $AlNH_4CO_3(OH)_2$ at a temperature of between about 200° and about 500° C., for a period of time of between



a fraction of a second and about 5 hours at atmospheric pressure, wherein the double carbonate has an X-ray diffraction diagram whose interplanar spacings and relative intensities have approximately the following values:

d A	$1/1_1$	d A	$1/1_1$	d A	$1/1_1$
5.82	100	2.57	25	1.815	2
4.07	21	2.25	5	1.729	12
3.41	10	2.19	7	1.657	7
3.32	44	2.038	20	1.465	3
2.90	18	1.991	9	1.429	6
2.63	2	1.879	2	1.410	3
				1.388	3

4,292,296

DIAGNOSTIC METHOD

George H. Parsons, Jr., Arlington, Mass., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 12, 1978, Ser. No. 941,707

Int. Cl.³ G01N *33/48;* A61K *43/00;* G01T *1/00*

U.S. Cl. 424—1 **41 Claims**

1. A method for directly determining free, unbound analyte in a sample containing a proportion of analyte bound to a receptor in the sample, comprising

(a) contacting the sample with an unlabelled receptor for the analyte to bind the free analyte in the sample;

(b) removing the sample from contact with the unlabelled receptor;

(c) contacting the unlabelled receptor with a labelled reagent selected from the group of

(i) a labelled analyte analogue, or

(ii) a labelled, soluble analyte receptor;

(d) separating the receptor of step c from unbound labelled reagent;

(e) measuring the amount of bound or unbound label; and

(f) correlating the measured amount in step (e) with the amount of free analyte in the sample.

4,292,297

SELENOMETHIONINE-^{75}SE-CONTAINING SOLUTION HAVING A THIOL AS A STABILIZER

Jan Nielsen, and Karel J. Panek, both of Petten, Netherlands, assignors to Byk-Mallinckrodt Cil B.V., Petten, Netherlands

Filed Feb. 12, 1979, Ser. No. 11,337

Claims priority, application Netherlands, Feb. 21, 1978, 7801908

Int. Cl.³ A61K *29/00, 43/00;* G01T *1/00*

U.S. Cl. 424—1 **16 Claims**

8. A method of performing radiodiagnostic tests comprising administering to an animal a stabilized selenomethionine solution comprising selenomethionine enriched with radioactive

^{75}Se and a thiol dissolved in a pharmaceutically acceptable liquid carrier, the thiol being an organic compound as represented by the formula

$$HS-(CH_2)_n-CHR-CO-NH-CH_2-COOH$$

in which formula n is 0 or 1 and R is a methyl group or a glutamyl group with the proviso that when n is 0, R represents the methyl group and when n is 1, R represents the glutamyl group.

4,292,298

PHARMACEUTICAL COMPOSITIONS CONTAINING PARACETAMOL

Adrian F. Davis, Dorking, England, assignor to Beecham Group Limited, England

Filed Sep. 12, 1980, Ser. No. 186,767

Claims priority, application United Kingdom, Sep. 14, 1979, 31925/79

Int. Cl.³ A61K *9/22, 9/52, 31/165, 31/375*

U.S. Cl. 424—10 **10 Claims**

1. An analgesic and antipyretic pharmaceutical composition suitable for oral administration, comprising paracetamol, characterised in that the composition further includes a sufficient amount of ascorbic acid in a sustained release form to counteract the potential liver toxicity effects of the paracetamol.

4,292,299

SLOW-RELEASING MEDICAL PREPARATION TO BE ADMINISTERED BY ADHERING TO A WET MUCOUS SURFACE

Yoshiki Suzuki; Hiroshi Ikura, both of Hino, and Gentaro Yamashita, Koganei, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP79-00284, § 371 Date Jul. 7, 1980, § 102(e) Date Jul. 7, 1980, PCT Pub. No. W080/00916, PCT Pub. Date May 15, 1980.

This PCT application filed Ser. No. 202,384

Claims priority, application Japan, Nov. 6, 1978, 53-135883

Int. Cl.³ A61L *15/03;* **A61K** *9/24*

U.S. Cl. 424—16 **9 Claims**

1. A slow-releasing medical preparation to be administered by adhering to a wet mucous surface comprising an adhesive layer composed of a polymer which has the adhesiveness to a wet mucous surface and a property to swell upon moistening and a nonadhesive, either water soluble or disintegrable, layer which has no adhesiveness to a wet mucous surface and at least either one of said adhesive layer and nonadhesive layer is made to contain a medicament.

4,292,300

CONTROLLED RELEASE SUPPOSITORIES

Geoffry A. Byrne, Gifford, and Ross I. Aylott, Edinburgh, both of Scotland, assignors to Inveresk Research International, Musselburgh, England

Filed Jul. 20, 1977, Ser. No. 817,412

Claims priority, application United Kingdom, Jul. 23, 1976, 30793/76

Int. Cl.³ A61K *9/02*

U.S. Cl. 424—19 **6 Claims**

1. A non-dissolving, non-disintegrating slow-release suppository consisting essentially of methyl cellulose, water, and a therapeutically effective amount of a water-soluble therapeutically active ingredient wherein the water is present in an amount of more than 35 parts by weight.

4,292,301

POLYMERIC DIFFUSION MATRIX CONTAINING EPHEDRINE

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 109,242, Jan. 3, 1980, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 47,084, Jun. 11, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,010

Claims priority, application Japan, Aug. 14, 1979, 54-103459

Int. Cl.³ A61L *15/03;* **A61K** *31/79*

U.S. Cl. 424—28 **10 Claims**

1. A self-supporting polymeric diffusion matrix for the sustained release of ephedrine in order to transdermally deliver said ephedrine to a patient and provide said patient with a decongestant effect, said matrix comprising from about 2 to about 60% of a polar plasticizer, from about 6 to about 20% by weight polyvinylalcohol, from about 2 to 10% by weight polyvinylpyrrolidone, and a pharmaceutically effective amount of ephedrine to provide a sustained release of said ephedrine over a prolonged period.

4,292,302

POLYMERIC DIFFUSION MATRIX CONTAINING TERBUTALINE

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 109,242, Jan. 3, 1980, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned, and Ser. No. 47,084, Jun. 11, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,104

Claims priority, application Japan, Aug. 14, 1979, 54-103459

Int. Cl.³ A61L *15/03;* **A61K** *31/79*

U.S. Cl. 424—28 **10 Claims**

1. A self-supporting polymeric diffusion matrix for the sustained release of terbutaline in order to transdermally deliver said terbutaline to a patient and provide said patient with a bronchodilator effect, said matrix comprising from about 2 to about 60% of a polar plasticizer, from about 6 to about 20% by weight polyvinylalcohol, from about 2 to 10% by weight polyvinylpyrrolidone, and a pharmaceutically effective amount of terbutaline to provide a sustained release of said terbutaline over a prolonged period.

4,292,303

POLYMERIC DIFFUSION MATRIX CONTAINING CLONIDINE

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 109,242, Jan. 3, 1980, which is a continuation-in-part of Ser. No. 47,084, Jun. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,106

Claims priority, application Japan, Aug. 14, 1979, 54-103459

Int. Cl.³ A61L *15/03;* **A61K** *31/79*

U.S. Cl. 424—28 **10 Claims**

1. A self-supporting polymeric diffusion matrix for the sustained release of clonidine in order to transdermally deliver said clonidine to a patient and provide said patient with an antihypertensive effect, said matrix comprising from about 2 to about 60% of a polar plasticizer, from about 6 to about 20% by weight polyvinylalcohol, from about 2 to 10% by weight polyvinylpyrrolidone, and a pharmaceutically effective amount of clonidine to provide a sustained release of said clonidine over a prolonged period.

4,292,304
OIL BASED DENTIFRICE

Ronald R. Barels, 14 Doral Dr., Moraga, Calif. 94566, and Daniel J. Ghinazzi, 1374 Mossy Ct., Concord, Calif. 94521

Filed Sep. 30, 1980, Ser. No. 192,465
Int. Cl.³ A61K *9/48, 9/16, 9/18, 31/355*
U.S. Cl. 424—37 **2 Claims**

1. An encapsulated dentifrice comprising:

an edible capsule having an interior chamber, said capsule adapted to be placed into a user's mouth, readily crushed between the teeth to release a dentifrice, and then the ruptured capsule chewed and/or swallowed, said capsule being formed of a gelatin material which is water soluble and which is substantially oil insoluble;

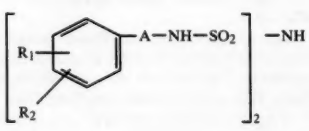
a quantity of from about 0.5 g to about 1 g of a substantially anhydrous, oil based dentifrice within said interior chamber and encapsulated by said capsule, said dentifrice including an edible oil base in an amount of from about 10 weight percent to about 85 weight percent of said dentifrice to thereby easily disperse said dentifrice throughout the oral cavity, an abrasive agent in an amount of from about 3 weight percent to about 35 weight percent of said dentifrice suspended therein to aid in the disposal of plaque, a surfactant agent, and at least about 10 mg of vitamin E.

4,292,305
ANTIALLERGIC IMIDODISULFAMIDES

Fadia E. Ali, Cherry Hill; Robert D. Krell, Medford, both of N.J., and Kenneth M. Snader, Hatboro, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 13, 1980, Ser. No. 121,066
Int. Cl.³ A61K *31/135;* **C07C** *143/72, 143/84*
U.S. Cl. 424—45 **14 Claims**

1. A compound represented by the formula:



wherein:

A is a single valence bond, an alkylene chain $-(CH_2)_n-$ in which n is a positive integer 2, 3, 4 or 6, a branched alkylene chain of from 2 to 4 carbon atoms, or phenylmethylene;

R_1 is hydrogen, 3- or 4-bromo, 3- or 4-chloro, or 3- or 4-trifluoromethyl; and

R_2 is hydrogen, with the proviso that when n is 2, R_1 is 4-chloro, 4-bromo, 4-methoxy or 3-trifluoromethyl and R_2 is hydrogen or together with R_1 in adjacent positions forms either a 3,4-dichloro substitution or a fused benzo ring, and further with the proviso that when A is a single valence bond R_1 is not hydrogen or 4-chloro, or

an alkali metal salt of said compound.

7. A pharmaceutical composition for inhibiting the symptoms of asthma comprising a nontoxic pharmaceutical carrier or diluent and an amount sufficient to produce said inhibition of a compound of claim 1.

4,292,306
DENTIFRICE WITH TOPICAL AND SYSTEMIC PHOSPHATE FLUORIDE SYSTEM

Frank R. Faunce, 201 Wilcrest Dr., Apt. 946, Houston, Tex. 77042

Division of Ser. No. 973,910, Dec. 28, 1978, Pat. No. 4,203,966. This application Nov. 8, 1979, Ser. No. 92,277
Int. Cl.³ A61K *7/18*
U.S. Cl. 424—52 **1 Claim**

1. A dentifrice composition for topical fluoride treatment of human teeth during oral hygiene, said dentifrice composition comprising:

a quantity of stannous fluoride sufficient to develop a fluoride concentration of said composition from about 0.03% to about 0.05% by weight of said dentifrice composition;

a sufficient quantity of sodium dihydrogen phosphate compound for pH adjustment to a pH range of about 3.5 and for developing an energized tooth surface for enhancement of said topical fluoride treatment, said stannous fluoride and said sodium dihydrogen phosphate providing a complex stannous fluoride fluorophosphate compound at the energized tooth surface during oral hygiene that develops a caries inhibiting fluorophosphate complex within the crystalline latticework of the tooth enamel; and

a water-free gel carrier that inhibits deterioration of the stannous fluoride and the sodium dihydrogen phosphate compound prior to use in an aqueous environment.

4,292,307
VACCINE AND METHOD FOR PROPHYLAXIS AND TREATMENT OF CLOSTRIDIOSES OF ANIMALS AND POULTRY

Valentina P. Zemlyakova, ulitsa Jugo-Zapadnaya, dom 73/26, kv. 48, Minsk, U.S.S.R.

Continuation of Ser. No. 942,145, Sep. 14, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,172
Claims priority, application U.S.S.R., Sep. 30, 1977, 2523702
Int. Cl.³ A61K *9/12, 39/08, 39/116*
U.S. Cl. 424—92 **12 Claims**

1. A universal vaccine for prophylaxis and treatment of clostridiosis of animals and poultry, comprising formaldehyde-detoxicated toxoids of *Clostridium perfringens* types A, B, and D, *Cl.oedematiens* and *Cl.septicum* separated from the microbial mass, a sorbent comprised of a aluminum gel and a solvent comprised of phosphate buffer and physiological salt solution in a weight ratio of about 1:1, said vaccine being substantially free of bacterial cells and nonspecific proteins, the antigenic activity of said components, expressed in combining units per ml of the vaccine being as follows:

toxoid of *Cl. perfringens* type A	2–100
toxoid of *Cl. perfringens* type B	2–100
toxoid of *Cl. perfringens* type D	1–80
toxoid of *Cl. oedematiens*	1–80
toxoid of *Cl. septicum*	2–10 mg
sorbent	1–10 mg
solvent	balance.

4,292,308
TREATMENT OF ANIMALS EXPOSED TO OR SUBJECT TO EXPOSURE TO ORGANOPHOSPHATE ANIMAL POISONOUS NERVE AGENTS

Murray J. Sanders, Delray Beach, Fla., and James A. Vick, Annandale, Va., assignors to Biotherapeutics, Inc., Delray Beach, Fla.

Filed Aug. 21, 1979, Ser. No. 68,446
Int. Cl.³ A61K *35/58, 39/38*
U.S. Cl. 424—98 **15 Claims**

1. A method for treatment of an animal exposed to, or subject to exposure to, organophosphate animal poisonous nerve agents, comprising administering to the animal an effective protective amount of detoxified but neurotropically active modified neurotoxin having a Semliki Forest Virus Test Plaque Forming Unit reduction of at least 30%, and being derived from venom selected from the group consisting of venom of a snake of the genus Naja or the genus Bungarus and combinations thereof.

4,292,309

ANTIBIOTICS C-14482 B_1, B_2 AND B_3

Eiji Higashide, Takarazuka; Seiichi Tanida, Nagaokakyo; Masayuki Muroi, Suita, and Mitsuko Asai, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 17, 1980, Ser. No. 113,131
Claims priority, application Japan, Feb. 2, 1979, 54-11561
Int. Cl.³ A61K *35/74;* **C12P** *1/04;* **C12N** *1/20*
U.S. Cl. 424—119 **5 Claims**

1. Antibiotics C-14482 B_1, B_2 or B_3 which have the following properties, and their salts

(a) Antibiotic C-14482 B_1:

(1) Elemental analysis (%) (recrystallized from acetone-hexane and dried under reduced pressure at a room temperature for 30 hours or more):
C 55.61±1.0
H 6.31±0.5
N 13.64±1.0

(2) Melting point: Not lower than 300° C.

(3) Absorption spectra in the ultraviolet and visible regions:
λ_{max}^{MeOH} 213±3 nm ($E_{1cm}^{1\%}$ 592±60)
λ_{max}^{MeOH} 283±3 nm ($E_{1cm}^{1\%}$ 227±25)
λ_{max}^{MeOH} 496±3 nm ($E_{1cm}^{1\%}$ 50.1±10)

(4) Infrared absorption spectrum (KBr disc method), principal peaks (cm^{-1}): 3580, 3420, 3175, 2950, 2900, 2840, 1685, 1650, 1610, 1455, 1395, 1345, 1330, 1250, 1230, 1175, 1110, 1075, 1025, 1000, 965, 940, 915, 855, 825, 780, 760;

(5) Solubility:
Insoluble in: Hexane, petroleum ether
Slightly soluble in: Ethyl acetate, chloroform, methylene chloride, diethyl ether, water;
Soluble in: Ethanol
Readily soluble in: Methanol, dimethyl sulfoxide

(6) Color reactions:
Negative to: Ninhydrin reaction, Sakaguchi reaction;
Positive to: Dragendorff's reaction, Barton reaction; Potassium permanganate reagent is decolorized;

(7) Acidity, neutrality of basicity: Weakly basic

(8) Color: Dark red or reddish brown

(9) Thin-layer chromatography; silica gel (Spot film f, Tokyo Kasei Co., Japan)
(i) Chloroform-methanol (9:1), Rf 0.37
(ii) Ethyl acetate-methanol (1:1), Rf 0.31

(b) Antibiotic C-14482 B_2:

(1) Elemental analysis (%) (dried under reduced pressure at a room temperature for 30 hours or more):
C 57.40±1.0
H 6.51±0.5
N 13.44±1.0

(2) Melting point: Not lower than 300° C.

(3) Absorption spectra in the ultraviolet and visible regions:
$_{max}^{MeOH}$ 214.5±3 nm ($E_{1cm}^{1\%}$ 555±60)
$_{max}^{MeOH}$ 283±3 nm ($E_{1cm}^{1\%}$ 207±25)
$_{max}^{MeOH}$ 499±3 nm ($E_{1cm}^{1\%}$ 55.8±10)

(4) Infrared absorption spectrum (KBr disc method), principal peaks (cm^{-1}): 3430, 2940, 2980, 1680, 1650, 1625, 1590, 1480, 1450, 1390, 1340, 1250, 1175, 1110, 1075, 1055, 1025, 995, 960, 940, 905, 855, 825;

(5) Solubility:
Insoluble in: Hexane, petroleum ether
Slightly soluble in: Ethyl acetate, diethyl ether, water
Soluble in: Ethanol, chloroform
Readily soluble in: Methanol, dimethyl sulfoxide

(6) Color reaction:
Negative to: Ninhydrin reaction, Sakaguchi reaction;
Positive to: Dragendorff's reaction, Barton reaction; Potassium permanganate reagent is decolorized;

(7) Acidity, neutrality or basicity: Weakly basic

(8) Color: Dark red or reddish brown

(9) Thin-layer chromatography; silica gel (spot film f. Tokyo Kasei Co., Japan)
(i) Chloroform-methanol (9:1), Rf 0.43
(ii) Ethyl acetate-methanol (1:1), Rf 0.23

(c) Antibiotic C-14482 B_3:

(1) Elemental analysis (%) (dried under reduced pressure at a room temperature for 30 hours or more):
C 58.74±1.0
H 6.64±0.5
N 14.31±1.0

(2) Melting point: Not lower than 300° C.

(3) Absorption spectra in the ultraviolet and visible regions:
λ_{max}^{MeOH} 214±3 nm ($E_{1cm}^{1\%}$ 620±60)
λ_{max}^{MeOH} 283±3 nm ($E_{1cm}^{1\%}$ 251±25)
λ_{max}^{MeOH} 492±3 nm ($E_{1cm}^{1\%}$ 55.6±10)

(4) Infrared absorption spectrum (KBr disc method), principal peaks (cm^{-1}): 3430, 2940, 2890, 1680, 1650, 1630, 1595, 1450, 1390, 1340, 1320, 1250, 1175, 1105, 1075, 1020, 995, 935, 905, 825;

(5) Solubility:
Insoluble in: Hexane, petroleum ether
Slightly soluble in: Ethyl acetate, diethyl ether, water
Soluble in: Ethanol, chloroform
Readily soluble in: Methanol, dimethyl sulfoxide

(6) Color reaction:
Negative to: Ninhydrin reaction, Sakaguchi reaction
Positive to: Dragendorff's reaction, Barton reaction; Potassium permanganate reagent is decolorized;

(7) Acidity, neutrality or basicity: Weakly basic

(8) Color: Dark red or reddish brown

(9) Thin-layer chromatography; silica gel (Spot Film f, Tokyo Kasei Co., Japan)
(i) Chloroform-methanol (9:1), Rf 0.20
(ii) Ethyl acetate-methanol (1:1), Rf 0.18.

4,292,310

METHOD OF TREATING HYPERCHOLESTEROLEMIA WITH N-ACYL AMPHOTERICIN B

Harry W. Gordon, 210 E. 181st St., Bronx, N.Y. 10457, and Carl P. Schaffner, 10 Youngs Rd., Trenton, N.J. 08619

Division of Ser. No. 794,920, May 9, 1977, Pat. No. 4,163,050, which is a division of Ser. No. 521,289, Nov. 6, 1974, Pat. No. 4,039,659, which is a division of Ser. No. 177,512, Sep. 2, 1971, Pat. No. 3,855,409, which is a continuation of Ser. No. 221,062, Jan. 26, 1972, Pat. No. 3,966,910, and a continuation of Ser. No. 24,797, Apr. 1, 1970, abandoned, which is a continuation of Ser. No. 627,313, Mar. 31, 1967, Pat. No. 3,627,879. This application Apr. 12, 1979, Ser. No. 29,198
Int. Cl.³ A61K *35/00*
U.S. Cl. 424—122 **3 Claims**

1. A process for treating hypercholesterolemia in a large mammal in need of said treatment which comprises orally administering an effective dose for treating hypercholesterolemia of N-acyl amphotericin B to said mammal.

4,292,311

CYANIDE ANTIDOTE

Stanley J. Sarnoff, 7507 Hampden La., Bethesda, Md. 20034

Filed Dec. 23, 1980, Ser. No. 219,852
Int. Cl.³ A61K *33/04, 33/02*
U.S. Cl. 424—162 **13 Claims**

1. A process of treating a mammal which has had cyanide poisoning with an antidote therefor comprising injecting the mammal with sufficient hydroxylamine hydrochloride solution to increase the mammal's methemoglobin concentration and to convert the cyanide to cyanomethemoglobin.

4,292,312
METHOD FOR PREPARING ALLOXAN STABLE AQUEOUS SOLUTIONS AND SOLUTIONS RESULTING THEREFROM

Henri Griffon, 72 Rue de Longchamps, 75782 Paris, France

Filed Jun. 13, 1980, Ser. No. 159,168
Claims priority, application France, Jun. 15, 1979, 79 15363
Int. Cl.³ A61K *31/00, 47/00, 31/505*
U.S. Cl. 424—176 **10 Claims**

1. A method for preparing a stable, aqueous solution of alloxan, which comprising:

dissolving in an aqueous fluid a predetermined quantity by weight of alloxan and adding from about 5 to 25 times the weight of said alloxan of at least one sugar selected from the group consisting of levulose, glucose and lactose to said fluid.

4,292,313
LRF ANTAGONISTS

Wylie W. Vale, Jr., and Jean E. F. Rivier, both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Apr. 15, 1980, Ser. No. 140,487
Int. Cl.³ A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **30 Claims**

1. A peptide or a nontoxic salt thereof, said peptide having the formula:

$$R_1\text{-}R_2\text{-pCl-D-Phe-D-Trp-Ser-Tyr-}R_3\text{-}R_4\text{-Arg-Pro-}R_5$$

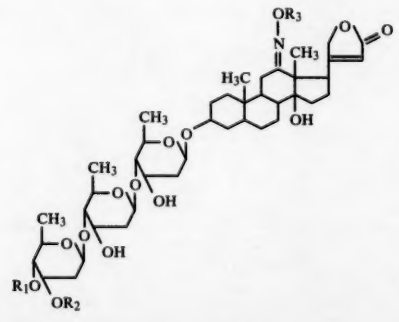
wherein R_1 is selected from the group consisting of hydrogen, formyl, acetyl, acrylyl, benzoyl and allyl; R_2 is selected from the group consisting of dehydro Pro, dehydro D-Pro, Thz and D-Thz; R_3 is selected from the group consisting of D-Trp and (imBzl)D-His; R_4 is selected from the group consisting of Leu and N^{α}MeLeu; and R_5 is selected from the group consisting of Gly—NH_2 and $NHCH_2CH_3$.

4,292,314
CARDIOACTIVE 12-DEHYDRODIGOXIN-OXIMES

Fritz Kaiser, Lampertheim; Klaus Koch, Mannheim; Wolfgang Schaumann, Heidelberg, and Wolfgang Voigtländer, Viernheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Sandhofer, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 151,481
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926026
Int. Cl.³ C07J *17/00;* **A61K** *31/58*
U.S. Cl. 424—182 **7 Claims**

1. A 12-dehydrodigoxin oxime of the formula



in which

R_1 and R_2 each independently is hydrogen, formyl, acetyl, propionyl, methyl, ethyl, n-propyl and isopropyl, or

R_1 and R_2 together are ethylidene, propylidene or cyclohexylidene, and

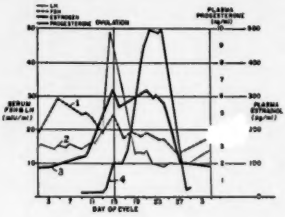
R_3 is hydrogen, methyl, ethyl, n-propyl, isopropyl, benzyl, phenylethyl or phenylpropyl.

6. A method for reducing the cardiac activity of a patient which comprises administering to such a patient enterally or parenterally in liquid or solid form a cardioactive effective amount of a compound according to claim 1.

4,292,315
FOLLICULAR PHASE ESTROGEN OR PROGESTIN WITH PHYSIOLOGIC ESTROGEN/PROGESTIN LUTEAL PHASE REPLACEMENT DRUG DELIVERY SYSTEM

Nichols Vorys, 336 S. Columbia Ave., Columbus, Ohio 43209

Division of Ser. No. 865,851, Dec. 30, 1977, abandoned. This application Aug. 24, 1979, Ser. No. 69,275
Int. Cl.³ A01N *45/00;* **A61K** *31/56*
U.S. Cl. 424—240 **20 Claims**



1. A drug delivery system including twenty-one (21) ordered and individually dispensable pharmacologically active tablets for the daily oral administration of one (1) tablet daily formulated in the predetermined order comprising:

an initial approximately seven (7) tablets which are first through seventh in the order of tablets, each including a same pharmacologically active low daily dosage of one unopposed steroid composition selected from the group of estrogen active steroids and progestin active steroids;

a following approximately four (4) tablets which are eighth through eleventh in the order of tablets, each containing a same pharmacologically low daily dosage of an estrogen active steroid combined with a progestin active steroid;

a following approximately seven (7) tablets which are twelfth through eighteenth in the order of tablets, each containing a same pharmacologically adequate regulation daily dosage of an estrogen active steroid combined with a progestin active steroid; and

a concluding approximately three (3) tablets which are nineteenth through twenty-first in the order of tablets, each containing a same diminished dosage of an estrogen active steroid combined with a progestin active steroid, the same diminished dosage reduced by approximately one-half in pharmacological dosage strength from the dosage strength of the preceding adequate daily dosage of combined steroids.

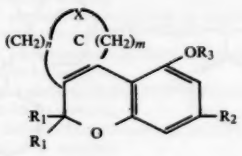
4,292,316
ANTIGLAUCOMA AGENTS

Anthony T. Dren, Waukegan, and Barbara A. Bopp, Lake Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 948,058, Oct. 2, 1978, Pat. No. 4,217,351, which is a division of Ser. No. 711,749, Aug. 4, 1976, Pat. No. 4,136,183. This application Jan. 17, 1980, Ser. No. 112,989
Int. Cl.³ A61K *27/00, 31/54, 31/495, 31/445*
U.S. Cl. 424—248.56 **3 Claims**

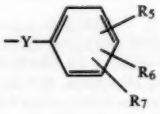
1. A method of reducing intra-ocular pressure in mammalian

patients comprising administering to a glaucoma patient a therapeutic effective amount of a compound of the formula

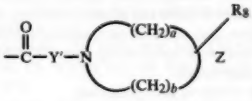


wherein, in the C ring, X is CH_2 or

n is an integer of 0 to 3 and m is an integer of 0 to 3; each R_1 is loweralkyl and when taken together the substituents R_1R_1 form oxygen; R_2 is a C_1–C_{20} straight or branched chain alkyl, cycloalkyl, or



wherein Y is a straight or branched chain alkylene group having from 1 to 10 carbon atoms, and each R_5, R_6 and R_7 are the same or different members selected from the group consisting of H, halo and loweralkyl; R_3 is



wherein Y' is a straight or branched chain alkylene group having 1 to 8 carbon atoms, a is an integer from 1 to 4, b is an integer from 1 to 4, Z is CH_2, O, S or NR_9 where R_9 is H or loweralkyl, with the provision that when Z is O, S or NR_9, the sum of a and b is 3 or 4, and R_8 is H or loweralkyl; and thepharmaceutically acceptable salts thereof.

4,292,317

1,4-DIHYDRO-QUINOLINE-3-CARBOXYLIC ACID DERIVATIVES, PROCESS FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Marcel Pesson, Paris, France, assignor to Laboratorie Roger Bellon, France and Dainippon Pharmaceutical, Japan

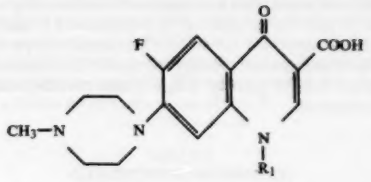
Filed Sep. 15, 1978, Ser. No. 942,635

Claims priority, application United Kingdom, Sep. 20, 1977, 39197/77; Apr. 3, 1978, 12983/78; May 30, 1978, 39197/12983/78

Int. Cl.³ A61K *31/495*; C07D *401/04*

U.S. Cl. 424—250 **12 Claims**

1. A compound of formula:



in which

R_1 is a methyl, ethyl, vinyl or allyl group and its physiologically acceptable non-toxic acid addition salts thereof.

7. An anti-bacterial pharmaceutical composition comprising at least one active compound according to any of claims **1**, **2**, **3**, **4** or **5** present in a pharmaceutically effective amount and in admixture with an inert, physiologically acceptable carrier.

4,292,318

PRODUCT AND METHOD FOR COMBATING SWINE DYSENTERY

Eugen Diethelm, Triesen, Liechtenstein, assignor to Grissman Chemicals Limited, England

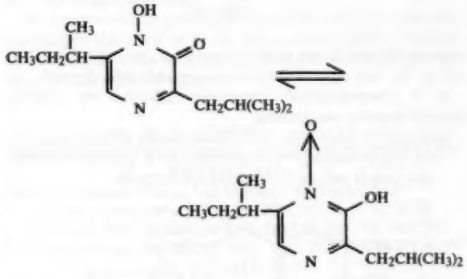
Filed Jun. 6, 1980, Ser. No. 157,100

Claims priority, application United Kingdom, Jul. 10, 1979, 24003/79

Int. Cl.³ A61K *31/495*

U.S. Cl. 424—250 **5 Claims**

1. A method for the treatment or prophylaxis of swine dysentery which comprises administering to swine an effective non-toxic amount of



4,292,319

ANTIPHLOGISTIC PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Oswald Tauber; Günther Engelhardt; Mátyás Leitold, and Günther Schmidt, all of Biberach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 25,718, Mar. 30, 1979, which is a continuation-in-part of Ser. No. 878,904, Feb. 17, 1978, Pat. No. 4,154,833. This application Jul. 14, 1980, Ser. No. 168,608

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708520

Int. Cl.³ A61K *31/19, 31/40, 31/445, 31/495*

U.S. Cl. 424—250 **7 Claims**

1. A method of suppressing the undesirable gastrointestinal side-effects produced by administering a non-steroidal antiphlogistic compound selected from the group consisting of 2-(4-isobutyl-phenyl)-propionic acid, 4-[4-(2'-fluorobiphenylyl)]-4-hydroxy-crotonic acid, d-2-(6-methoxy-2-naphthyl)-propionic acid, o-[(2,6-dichloro-phenyl)-amino]-phenylacetic acid, 2-(2-fluoro-4-biphenyl)-propionic acid, and nontoxic, pharmaceutically acceptable salts thereof formed with

inorganic or organic bases, to a warm-blooded animal in need thereof, which comprises simultaneously administering to said animal 1 part by weight of 5,11-dihydro-11-[4-methyl-1-piperazinyl)-acetyl]-6H-pyrido[2,3-b][1,4]benzodiazepin-6-one or a non-toxic, pharmaceutically acceptable acid addition salt thereof per 2 to 500 parts by weight of non-steroidal antiphlogistic compound.

4,292,320

1,2,3,4-TETRAHYDROISOQUINOLINE DERIVATIVES AND THE PREPARATION THEREOF

Teiji Kishimoto, Kawanishi; Hiromu Kochi, Sakai, and Yoshiyuki Kaneda, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

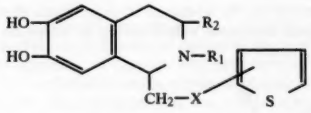
Continuation of Ser. No. 695,975, Jun. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 489,993, Jul. 19, 1974, Pat. No. 3,978,063. This application Aug. 17, 1979, Ser. No. 67,393

Claims priority, application Japan, Jul. 30, 1973, 48/85987

Int. Cl.[3] **A61K** *31/47;* **C07D** *409/12*

U.S. Cl. 424—258 **4 Claims**

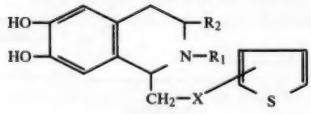
1. A 1,2,3,4-tetrahydroisoquinoline having smooth muscle relaxant activity of the formula:



wherein R_1 and R_2 are each hydrogen or lower alkyl and X is -O- or -S-, and pharmaceutically acceptable salts thereof.

4. A pharmaceutical composition effective for relaxing smooth muscles, comprising:

as an active ingredient, a pharmaceutically effective amount of 1,2,3,4-tetrahydroisoquinoline or a pharmaceutically acceptable salt thereof having the formula:



or mixtures thereof, wherein R_1 and R_2 are each hydrogen or lower alkyl and X is -O- or -S-, in a pharmaceutically acceptable carrier.

4,292,321

1,3,8-TRIAZASPIRODECANE-4-ONES, PHARMACEUTICAL COMPOSITIONS THEREOF AND METHOD OF USE THEREOF

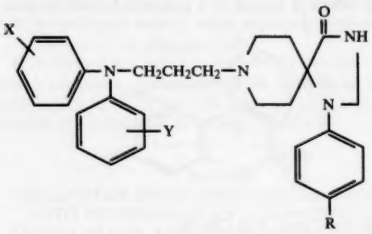
Ian C. Pattison, Ann-Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 42,175, May 24, 1979, abandoned. This application Jan. 10, 1980, Ser. No. 111,043

Int. Cl.[3] **A61K** *31/445;* **C07D** *471/10;* **A61K** *31/415*

U.S. Cl. 424—267 **8 Claims**

1. A compound having the structural formula II



(II)

wherein X is hydrogen, halogen, lower alkyl or nitro; Y is hydrogen, halogen, lower alkyl or nitro; R is hydrogen, halogen, lower alkyl, or lower alkoxy; and the non-toxic, pharmaceutically acceptable salts thereof.

7. A composition for treating schizophrenia and related ailments in a mammal consisting essentially of an anti-schizophrenically effective amount of a compound as defined in claim 1, in combination with a pharamceutically acceptable carrier.

4,292,322

METHOD FOR KILLING INSECTS WITH ELECTRO-MECHANICAL ULTRASONIC NEBULIZER

Takayoshi Muramoto, Hiroshima, and Kunitaka Orita, Yanai, both of Japan, assignors to Fumakilla Limited, Tokyo, Japan

Continuation of Ser. No. 696,825, Jun. 16, 1976, Pat. No. 4,173,651. This application Aug. 9, 1979, Ser. No. 65,173

Int. Cl.[3] **A01N** *43/36, 37/00, 37/08*

U.S. Cl. 424—274 **2 Claims**

1. A method of killing insects on plants or in nearby air comprising the steps of:

applying thereto an insecticidal effective amount of a composition selected from the group consisting of the following solutions, and wherein each solution contains an agent and a solvent, said agent being about 2 to 20% by weight of said composition:

a solution of allethrin in n-tridecane;
a solution of resmethrin in n-tridecane;
a solution of phenothrin in n-tridecane;
a solution of phthalthrin in n-tridecane;
a solution of permethrin in n-tridecane;
a solution of allethrin in n-tetradecane;
a solution of resmethrin in n-tetradecane;
a solution of phenothrin in n-tetradecane;
a solution of phthalthrin in n-tetradecane;
a solution of permethrin in n-tetradecane;
a solution of allethrin in kerosene-isopropyl alcohol (78:7 by weight);
a solution of resmethrin in kerosene-isopropyl alcohol (78:7 by weight);
a solution of phenothrin in kerosene-isopropyl alcohol (78:7 by weight);
a solution of phthalthrin in kerosene-isopropyl alcohol (78:7 by weight);
a solution of permethrin in kerosene-isopropyl alcohol (85:5 by weight);
a solution of kadethrin in kerosene-isopropyl alcohol (85:5 by weight);
a solution of cypermethrin in kerosene-isopropyl alcohol (85:5 by weight);
a solution of decamethrin in kerosene-isopropyl alcohol (85:5 by weight);
a solution of permethrin-allethrin in kerosene-isopropyl alcohol (90:10 by weight);
a solution of phenothrin-allethrin in kerosene-isopropyl alcohol (90:10 by weight);
a solution of kadethrin-allethrin in kerosene-isopropyl alcohol (90:10 by weight);

a solution of decamethrin-allethrin in kerosene-isopropyl alcohol (90:10 by weight);
a solution of cypermethrin-allethrin in kerosene-isopropyl alcohol (90:10 by weight);
a solution of permethrin-phthalthrin in kerosene-isopropyl alcohol (90:10 by weight);
a solution of phenothrin-phthalthrin in kerosene-isopropyl alcohol (90:10 by weight);
a solution of kadethrin-phthalthrin in kerosene-isopropyl alcohol (90:10 by weight);
a solution of decamethrin-phthalthrin in kerosene-isopropyl alcohol (90:10 by weight);
a solution of cypermethrin-phthalthrin in kerosene-isopropyl alcohol (90:10 by weight);
a solution of permethrin in kerosene-ethyl alcohol (93:7 by weight);
a solution of permethrin in kerosene-ethyl malonate (93:7 by weight);
a solution of permethrin in kerosene-sesame oil (93:7 by weight);
a solution of permethrin in kerosene-sesame oil-isopropyl alcohol (93% kerosene and equal mixtures of the other two solvents); and
a solution of permethrin in kerosene-isopropyl alcohol-ethyl alcohol (93% kerosene and equal mixtures of the other two solvents),

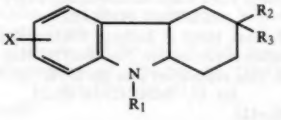
wherein said composition is applied by nebulization in an electromechanical ultrasonic transducer operating in a frequency range of between 800,000 and 1,700,000 Hz to effect atomization and vaporization in air of a uniform concentration of said composition, the atomized and vaporized particles of said composition having a particle size in the range of 0.5 to 5 microns.

4,292,323
PHENYL-1,2,3,4-TETRAHYDROCARBAZOLES AND USE THEREOF

Pirouz Tahbaz, Cedar Grove, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Mar. 31, 1980, Ser. No. 136,015
Int. Cl.³ C07D *209/88;* A61K *31/40*
U.S. Cl. 424—274 **10 Claims**

1. A 1,2,3,4-tetrahydrocarbazole of the formula



wherein X is methoxy, halo or methyl; R_1 and R_2 are hydrogen and R_3 is phenyl or halo or alkoxy substituted phenyl.

10. A method for treating mental depression in warm blooded animals which comprises administering thereto a therapeutically effective quantity of a compound of claim **1**.

4,292,324
AQUEOUS ZINC SOLUTIONS FOR MEDICAL USE

Karl E. Jönsson, Lund, and Nils F. E. Moren, Staffanstorp, both of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

Continuation of Ser. No. 849,174, Nov. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 845,367, Oct. 25, 1977, abandoned, which is a continuation of Ser. No. 71,720, Apr. 25, 1975, abandoned. This application Mar. 19, 1979, Ser. No. 22,208
Claims priority, application Sweden, May 2, 1974, 7405839
Int. Cl.³ A61K *31/315*
U.S. Cl. 424—289 **5 Claims**

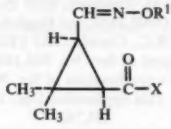
1. In the treatment of zinc deficiency in mammals, including humans, by administering zinc gastrointestinally, the improvement which comprises administering zinc orally in the form of a palatable aqueous solution containing a zinc salt and a complex-forming carboxylic acid selected from the group consisting of citric acid, tartaric acid, malic acid, lactic acid, and glycolic acid, and acid anhydrides and salts thereof, the relation of complex former to zinc being at least equimolecular and the amount of zinc being 3 to 500 mg per peroral dose, the pH of the solution being in the range of 3 to 9.

4,292,325
OXYIMINO-SUBSTITUTED (1R,CIS)CYCLOPROPANECARBOXYLATE PESTICIDES

Steven A. Roman, Oakdale, and Samuel B. Soloway, Modesto, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 13,841, Feb. 21, 1979, which is a continuation-in-part of Ser. No. 911,743, Jun. 2, 1978, abandoned. This application Aug. 15, 1980, Ser. No. 178,336
Int. Cl.³ A01N *53/00;* C07C *131/02*
U.S. Cl. 424—304 **14 Claims**

1. A (1R,cis)-cyclopropane compound, substantially free of other stereoisomers, having the formula



wherein R^1 is an alkyl group containing from 3 to 6 carbon atoms and X is OR in which R is α-cyano-3-phenoxybenzyl or 3-phenoxybenzyl, with the proviso that when R is α-cyano-3-phenoxybenzyl then the alcohol moiety is in the R,S-racemic or S-optical configuration.

10. A method of controlling pests at a locus which comprises applying to the pests or to the locus a pesticidally effective amount of an oxyimino-substituted (1R,cis)cyclopropane carboxylate according to claim **1**.

4,292,326
PROCESS FOR TREATMENT OF HYPERPIGMENTARY DERMATOSES

Marcella Nazzaro-Porro, Via Viminale 38, Rome, Italy

Continuation-in-part of Ser. No. 895,565, Apr. 12, 1978, abandoned. This application Dec. 1, 1978, Ser. No. 965,584
Claims priority, application Italy, Dec. 30, 1977, 31471 A/77
Int. Cl.³ A61K *31/19*
U.S. Cl. 424—317 **9 Claims**

1. A method for the treatment of individuals exhibiting noncancerous or non-precancerous hyperpigmentary dermatoses which comprises administering to said individual a therapeutically effective amount of an active ingredient in a pharmaceutically acceptable carrier until said condition is reduced or its further development is arrested wherein said active ingredient is at least one dicarboxylic acid containing from 7 to 13 carbon atoms or a mono or dimercapto derivative of said acid or a salt thereof.

4,292,327
METHOD FOR TREATMENT OF HUMAN EYE DISEASE

Lewis A. Johnson, 1050 Park Ave., New York, N.Y. 10028, and Emil Wirostko, E. 208 Midland Ave., Paramus, N.J. 07652

Division of Ser. No. 932,904, Aug. 11, 1978, Pat. No. 4,220,657, which is a division of Ser. No. 453,463, Jan. 23, 1974, abandoned. This application Mar. 31, 1980, Ser. No. 135,887
Int. Cl.³ A61K *31/13*
U.S. Cl. 424—325 **20 Claims**

1. A method of treating active endogenous uveitis caused by *Micromyces intracellularis* comprising administering to a patient having endogenous uveitis an effective amount therefor

of a therapeutic agent comprising d-2,2'-(ethylenediimino) di-1-butanol.

6. A method of treating chronic conjunctivitis caused by *Micromyces intracellularis* comprising administering to a patient having chronic conjunctivitis an effective amount therefor of a therapeutic agent comprising d-2,2'-(ethylenediimino)-di-1-butanol.

11. A method of treating kerato-conjunctivitis caused by *Micromyces intracellularis* comprising administering to a patient having kerato-conjunctivitis an effective amount therefor of a therapeutic agent comprising d-2,2'-(ethylenediimino1(di-1-butanol.

16. A method of treating keratitis caused by *Micromyces intracellularis* comprising administering to a patient having keratitis an effective amount therefor of a therapeutic agent comprising d-2,2'-(ethylenediimino)di-1-butanol.

4,292,328

THERMOPHILIC AEROBIC DIGESTION PROCESS FOR PRODUCING ANIMAL NUTRIENTS AND OTHER DIGESTED PRODUCTS

T. Lionel Coulthard, 4433 W. 6th Ave., Vancouver, B.C., Canada (V6R 1V2); Philip M. Townsley, 4569 W. 13th Ave., Vancouver, B.C., Canada (V6R 2V5), and Hugh S. Saben, 819 W. 20th Ave., Vancouver, B.C., Canada (V52 1Y3)

Continuation-in-part of Ser. No. 935,141, Aug. 21, 1978, abandoned, which is a continuation of Ser. No. 679,994, Apr. 26, 1976, abandoned. This application Dec. 18, 1979, Ser. No. 104,763

Int. Cl.³ A23K *1/14, 1/12*

U.S. Cl. 426—2 **28 Claims**

1. A process for using thermophilic bacterial microorganisms for thermophilically digesting an aqueous mixture of at least one material selected from the group consisting of animal fecal matter, lignocellulose and vegetable matter under aerobic conditions consisting essentially the steps of:

introducing said mixture into a digester that is sufficiently insulated to prevent substantial heat loss therefrom,

continuously introducing air into said mixture while continuously, mechanically and vigorously agitating said mixture, said air being introduced at a rate sufficient to maintain the dissolved oxygen level in said mixture above about 0.2 mg/l. and said mixture being vigorously agitated at a level effective to cause and promote the temperature of said mixture to rise from ambient temperatures, through mesophilic temperatures, to a temperature of at least 55° C. without the addition of external heat to said mixture until said material is digested, said mixture when digested forming a digested product, said air further being supplied at a rate sufficient to maintain a dissolved oxygen level in said mixture effective to supply the biological oxygen demand of the mixture,

continuing to agitate said mixture at a level and to introduce said oxygenating gas at a rate effective to maintain said temperature of at least 55° C. without the addition of external heat, said oxygenating gas being introduced at a rate sufficient to raise the dissolved oxygen level in said mixture to and maintain it above about 1.0 mg/l. after the temperature of said mixture has reached 55° C.

4,292,329

CENTER-FILLED CHEWING GUM

Koichi Ogawa, Tokyo; Shichigoro Tezuka, Kawasaki; Masatoshi Terasawa, Tokorozawa, and Shizuo Iwata, Tama, all of Japan, assignors to Lotte Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 875,205, Feb. 6, 1978, Pat. No. 4,157,402. This application Feb. 9, 1979, Ser. No. 10,893

The portion of the term of this patent subsequent to Jun. 5, 1996, has been disclaimed.

Int. Cl.³ A23G *3/30*

U.S. Cl. 426—5 **16 Claims**

1. In a method of making chewing gum having a gum base and a flavored, liquid center fill, the improvement comprising the steps of adding a natural emulsifier to the center fill in an amount of from 0.01–0.50% by weight of the center fill, said natural emulsifier being selected from the group consisting of lecithin, alginic acid, gelatin, natural gums, or a mixture thereof, and thereafter incorporating the center fill with said emulsifier into the base.

4,292,330

BREAD LEAVENING YEAST

Wilmore Williams, Wheaton, and Anthony J. Luksas, Chicago, both of Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Jul. 18, 1979, Ser. No. 58,619

Int. Cl.³ A21D *2/00*

U.S. Cl. 426—20 **16 Claims**

1. In a process for producing a leavened dough, comprising forming a dough of a cereal, shortening, leavening yeasts and a yeast growth source, fermenting the dough and leavening the dough, the improvement wherein the leavening yeasts are at least in part rapid flavor-producing yeasts which are a mixture of *Candida lusitaniae* and *Saccharomyces delbrueckii.*

4,292,331

PROCESS AND COMPOSITION FOR THE PRESERVATION OF VEGETABLES

Louis Ostre, Paris, France, assignor to Ceva, France

Continuation-in-part of Ser. No. 824,448, Aug. 15, 1977, abandoned. This application Jul. 9, 1979, Ser. No. 55,545

Claims priority, application France, Aug. 17, 1976, 76 24943; May 18, 1977, 77 15417

Int. Cl.³ A23B *7/10;* **A23K** *3/00*

U.S. Cl. 426—52 **15 Claims**

1. In the process of ensilaging vegetables by lactic acidification comprising addition of sufficient bacteria causing lactic fermentation thereof to raise the pH to below about 4.5, the improvement which comprises additionally adding to said vegetables an agent which is capable of degrading higher carbohydrates into fermentable sugars usable by said lactic bacteria in an amount sufficient to produce sufficient fermentable sugars to realize said pH by said lactic fermentation, said agent being Enterobacteriacees bacteria capable of fermenting starch but not capable of fermenting maltose.

4,292,332

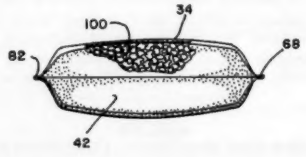
CONTAINER FOR PREPACKAGING, POPPING AND SERVING POPCORN

David E. McHam, 16061 E. Kellogg, Wichita, Kans. 67230

Continuation-in-part of Ser. No. 684,719, May 10, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 870,838

Int. Cl.³ B65D *81/34, 65/28*

U.S. Cl. 426—111 **7 Claims**



7. A cooking bag comprising a fluid impervious and expansible container formed of a flexible sheet material, said sheet material being comprised of kraft paper having a fluid impervious coating of a synthetic resin on one side thereof, said one side of the paper being on the innermost side of the container, a common means for both venting the bag solely when fluid pressure exceeds a predetermined superatmospheric pressure that is less than that which will otherwise disrupt the integrity of the bag, and for opening after its contents are cooked, said common means comprising the sheet material having an intermittent line of scoring which comprises cut intervals spaced by

unscored segments with said cut intervals being of a depth which extends through the paper layer and penetrates a fraction only of the resin coating, the remaining fractional thickness of the resin coating in the cut intervals having sufficient thickness to prevent food contaimination and sufficient strength to withstand bag expanding pressure but is frangible at a superatmospheric pressure that is less than that required to disrupt the integrity of the container thus allowing the intervals to open for the passage of steam or vapor therethrough while the unscored segments remain intact being manually rupturable when the bag is to be opened.

4,292,333

LOW-FAT, BUTTER-FLAVORED, LIQUID SPREAD AND PROCESS

Peter M. Bosco, Brookfield Center, and William L. Sledzieski, Norwalk, both of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,645
Int. Cl.³ A23D *3/00, 5/00*
U.S. Cl. 426—335 **19 Claims**

9. A process for preparing a low-fat, butter-flavored spread, which comprises: preparing an oil-in-water emulsion by admixing a dispersed phase comprising butter flavor, from 5 to 40%, based on the weight of the emulsion, of a fat having an SFI profile within the following ranges

50° F.—0–35%
70° F.—0–25%
92° F.—<8%,

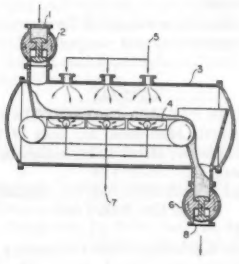
with a continuous aqueous phase, including a stabilizer, and an emulsifier system comprising a combination of lipophilic emulsifier and a hydrophilic emulsifier, the emulsifier system being present in an amount of from 0.1 to 4.0%, based on the total weight of the spread, and each of the lipophilic and hydrophilic emulsifiers being present at levels of at least 0.025% on the same basis, and the relative and total amounts of the emulsifiers and stabilizer being effective to provide a stable emulsion and a product which is liquid at about 40° F.; and homogenizing the emulsion under conditions effective to form a stable product which is liquid at about 40° F.

4,292,334

PROCESS FOR PUFFING FEATHER OR ANIMAL FUR

Yoshihiko Nishizawa; Yoshihiro Aketa, both of Noda, and Takeshi Akao, Abiko, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Continuation of Ser. No. 948,797, Oct. 5, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 113,977
Int. Cl.³ A23L *1/18*
U.S. Cl. 426—447 **2 Claims**



1. A process for treating animal feathers or animal fur which comprises feeding uncompressed animal feathers or animal fur into a pressure-resistant vessel, directly heating it for 2 to 10 minutes under an elevated pressure in the presence of a saturated steam of 4–8 Kg/cm² G or a superheated steam of 4–6 Kg/cm² G at a temperature of 180°–240° C., then rapidly discharging it into an atmosphere of lower pressure to instantaneously puff-explode said animal feathers or animal fur.

4,292,335

METHOD FOR SEPARATING THE FRUIT FLESH OF NUTS OR KERNELS INTO FIBRE MASS, OIL AND CELL LIQUID

Olof Jönsson, Drottningtorget 3, S- 211 25 Malmö, Sweden

Filed Dec. 11, 1979, Ser. No. 102,511
Claims priority, application Sweden, Dec. 21, 1978, 7813155
Int. Cl.³ A23L *1/36*
U.S. Cl. 426—489 **4 Claims**

1. A method of separating the fruit flesh of nuts or kernels into fibre mass, oil and cell liquid, which comprises tempering the fruit flesh to a temperature of 0° to 70° C. at which the oil is in liquid form without the proteins coagulating, then cutting the fruit flesh to comminute it and, simultaneously, centrifuging it to divide it into a fibre mass and a liquid mixture comprising oil and cell liquid, and to break down natural emulsions, and filtering the fibre mass to separate it from the liquid mixture.

4,292,336

SWEETENING COMPOSITIONS CONTAINING PEPTIDE SWEETENERS AND A METHOD FOR THEIR MANUFACTURE

Zdenek Latymer, Reading, England, assignor to Talres Development (N.A.) N.V., Netherlands Antilles

Filed Feb. 1, 1980, Ser. No. 117,445
Claims priority, application United Kingdom, Feb. 6, 1979, 4165/79
Int. Cl.³ A23L *1/236*
U.S. Cl. 426—548 **16 Claims**

1. A sweetening composition which comprises gelatin intimately mixed with a protein sweetener selected from the group consisting of monellin and thaumatin, the ratio by weight of gelatin to protein sweetener being 1:1 to less than 100:1.

4,292,337

SUGAR-FREE CONFECTIONERY MATERIAL BASED ON XYLITOL AND SORBITOL

Geert Andersen, Halle, Fed. Rep. of Germany, assignor to August Storck KG, Halle, Fed. Rep. of Germany

Filed Mar. 25, 1980, Ser. No. 133,781
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912411
Int. Cl.³ A23G *3/00*
U.S. Cl. 426—573 **2 Claims**

1. Chewy sugar-free confectionery material comprising,
about 20 to 50 wt.% of a sugar-free swelling agent selected from the group consisting of a carrageenate, a pectin, agar, an alginate, carob bean flour, tragacanth, methyl cellulose, carboxymethyl cellulose, gelatine, gum arabic and low-sugar maltodextrin,
about 20 to 35 wt.% xylitol;
about 0.5 to 3 wt.% water, and
about 0.1 to 5 wt.% of one or more additives selected from the groups consisting of aromatic substances, flavoring, acids and dyes,
the remainder being sorbitol.

4,292,338
PROCESS FOR PRODUCING CONFECTIONERS' BUTTER

George E. Ainger, Wareham, and Brian L. Caverly, Neopham, both of England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 848,675, Nov. 4, 1977, Pat. No. 4,214,012, which is a continuation of Ser. No. 393,865, Sep. 4, 1973, abandoned, which is a continuation of Ser. No. 210,550, Dec. 21, 1971, abandoned. This application Sep. 13, 1979, Ser. No. 75,342
Claims priority, application United Kingdom, Jan. 6, 1971, 714/71
Int. Cl.[3] A23D *3/02*
U.S. Cl. 426—603 1 Claim

1. A process of producing confectioners' butter comprising co-randomising a lauric component with a non-lauric component to produce an ester interchanged co-randomized fat having an iodine value from 10–25, a slip melting point of between 28° and 40° C., a dilatation drop of at least 500 over the last 10° C. below the slip melting point and having a fatty acid composition in random distribution of a blend consisting essentially of at least 88 weight percent C_{10}-C_{18} fatty acids including at most 15 weight percent stearic acid of from 80–50 weight percent lauric and 20–50 weight percent edible non-lauric fats wherein the sum of the palmitic and stearic acid content of said composition is 45 weight percent.

4,292,339
STABLE CONCENTRATED LACTIC ACID CONTAINING MIXTURE

Hans E. Bisle, Ingelheim am Rhein, Fed. Rep. of Germany, assignor to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 867,483, Jan. 6, 1978, abandoned. This application Sep. 28, 1979, Ser. No. 80,057
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700568
Int. Cl.[3] A23L *1/22*
U.S. Cl. 426—650 9 Claims

1. A stable, aqueous solution of a mixture of pre-mixed edible, organic acids consisting essentially of lactic acid and solid edible organic acids, said solution having a dry substance content of over 55% by weight, wherein a mixture of lactic acid and more than 5% and up to 25% by weight, based on the weight of the total mixture, of an organic acid selected from the group consisting of citric acid, tartaric acid, malic acid, and gluconic acid is present in aqueous solution and between about 8 to 20% of the acid equivalents are neutralized by potassium ions or a mixture of ions consisting predominantly of potassium ions.

4,292,340
METHODS AND APPARATUS FOR PRODUCING CRYOGENIC INERTIALLY DRIVEN FUSION TARGETS

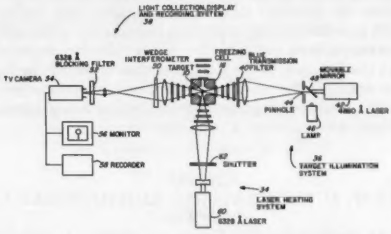
John R. Miller, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 872,284, Jan. 25, 1978. This application Aug. 20, 1979, Ser. No. 67,859
Int. Cl.[3] E21B *47/00*
U.S. Cl. 427—6 3 Claims

1. In a method of forming a solid substantially uniform layer of material on a surface of a microballoon on which said material is deposited at cryogenic temperatures the steps comprising:

maintaining said microballoon at cryogenic temperatures within an isothermal freezing cell;

locally heating said microballoon to vaporize said material deposited on said surface of said microballoon; and then, rapidly removing local heating such that said material vaporized by said local heating condenses and freezes on

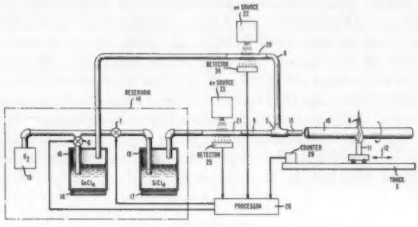


said surface of said microballoon in a solid substantially uniform layer.

4,292,341
METHOD OF CONTROLLING THE INDEX PROFILE OF OPTICAL FIBER PREFORMS

Dietrich Marcuse, Lincroft, and Herman M. Presby, Highland Park, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 26, 1980, Ser. No. 124,923
Int. Cl.[3] G03C *17/02;* G02B *1/10, 5/14*
U.S. Cl. 427—10 16 Claims



1. A method of fabricating an optical fiber preform characterized by a process that includes the steps of:

illuminating (**22**, **23**) the gaseous precursor being delivered to a preform substrate tube (**10**) with ultraviolet radiation;

detecting (**24**, **25**) the radiant energy from said illuminated gas;

comparing (**26**) the intensity of the detected energy with a reference signal;

and changing the concentration of the measured material in said gas in response to said comparison.

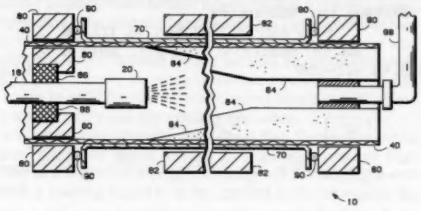
4,292,342
HIGH PRESSURE PLASMA DEPOSITION OF SILICON

Kalluri R. Sarma; M. John Rice, Jr., both of Tempe, and I. Arnold Lesk, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumberg, Ill.

Filed May 9, 1980, Ser. No. 148,095
Int. Cl.[3] B05I *1/08*
U.S. Cl. 427—34 10 Claims

1. A process for depositing silicon in a plasma reactor apparatus which comprises the steps of: providing a substrate positioned in said reactor apparatus, said substrate heated to an elevated deposition temperature; providing a high pressure plasma nozzle for conveying separate gas streams; raising said high pressure nozzle to a high rf potential to initiate a high pressure plasma in said reactor apparatus; introducing hydrogen and silicon bearing reactant through said high pressure plasma nozzle to create a plasma of said hydrogen and said

silicon bearing reactant; reacting said plasma of hydrogen and said silicon bearing reactant to deposit silicon on said substrate;



removing said substrate from said reactor apparatus; and separating said silicon and said substrate.

4,292,343

METHOD OF MANUFACTURING SEMICONDUCTOR BODIES COMPOSED OF AMORPHOUS SILICON

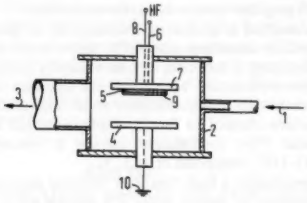
Rolf Plaettner, Ottobrunn; Wolfgang Kruehler, Unterhaching, and Josef Grabmaier, Berg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 30, 1980, Ser. No. 116,982

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904171

Int. Cl.³ C23C *11/00*

U.S. Cl. 427—39 **8 Claims**



1. A process for producing semiconductor bodies comprised of amorphous silicon and useful for fabrication of solar cells, comprising:

sequentially depositing a plurality of individual amorphous silicon layers onto a heat-resistant substrate via a glow discharge at temperatures in the range of about 200° to 300° C. and in an enclosed chamber containing a reaction gas at a pressure in the range of about 0.06 to 5 mbar, said gas including a gaseous silicon halide compound; and

hydrogenating each individual amorphous silicon layer with atomic hydrogen in the same enclosed chamber and at substantially identical temperature-pressure conditions used to deposit such layer before depositing a subsequent amorphous silicon layer.

4,292,344

FLUIDIZED BED HEATING PROCESS AND APPARATUS

Edward J. McHale, North Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 23, 1979, Ser. No. 14,645

Int. Cl.³ C01B *33/00*; H05B *6/54*

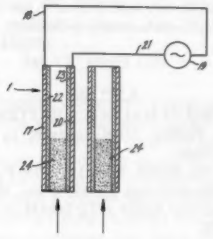
U.S. Cl. 427—45.1 **44 Claims**

10. An improved process for the production of high purity, polycrystalline silicon in a fluidized bed reaction zone comprising:

(a) introducing a silicon-containing gas capable of gas phase decomposition into a fluidized bed of silicon seed particles in a reaction zone maintained within the decomposition temperature range of said gas and below the melting point temperature of silicon, said decomposition temperature being maintained by applying an A.C. voltage potental between spaced-apart electrodes positioned in contact with said fluidized bed, at least one of said electrodes having a dielectric coating thereon, said voltage potential and the electrical frequency being sufficient to create electrical currents through the individual solid particles in said fluidized bed, with the heat dissipated within said individual particles being the predominant heat dissipated in said fluidized bed;

(b) removing unreacted fluidizing vapor and reaction by-product gases from said fluidized bed reaction zone; and

(c) withdrawing said particles having silicon product deposited thereon from said reaction zone, whereby silicon is recoverable as low-cost, high purity polycrystalline product capable of being produced at relatively high production rates on a semicontinuous or continuous basis, the heat flow within said reaction zone passing from the individual particles to the surrounding gas within the fluidized bed and then exiting through the wall of the reaction zone or with said fluidizing vapor and by-product gases, the individual silicon particles thus being the hottest portion of the reaction zone, thereby enhancing the heterogeneous depositing of silicon on the seed particles and minimizing undesired coating of silicon on the wall of the reaction zone and the homogeneous formation of fine silicon powder within said reaction zone.



4,292,345

METHOD OF PROTECTING CARBON-CONTAINING COMPONENT PARTS OF METALLURGICAL UNITS FROM OXIDATION

Mikhail I. Kolesnik, ulitsa Posadochnaya, 6, kv. 12; Anatoly P. Egorov, ulitsa Portovaya, 9a, kv. 9; Anatoly A. Kuznetsov, ulitsa Istoricheskaya, 20, kv. 116; Anatoly P. Gobov, ulitsa Rekordnaya, 34, kv. 5; Jury M. Ryabukhin, ulitsa Pobedy, 95, kv. 49, all of Zaporozhie; Viktor A. Rudakov, ulitsa Bogdana Khmelnitskogo, 60, kv. 121; Gennady V. Pisarev, ulitsa 23 Partsiezda, 1, kv. 45, both of Kalush Ivano-Frankovskoi oblasti; Jury M. Zheleznov, prospekt Lenina, 234, kv. 27, Zaporozhie, and Alexei V. Vasiliev, ulitsa Bogdana Khmelnitskogo, 66, kv. 57, Ivano-Frankovskaya oblast. Kalush, all of U.S.S.R.

Filed Feb. 4, 1980, Ser. No. 118,637

Int. Cl.³ B05D *3/02, 5/12*; H01B *1/06*

U.S. Cl. 427—113 **18 Claims**

1. A method of producing carbon-containing component parts of metallurgical units which are protected against oxidation, comprising the steps of:

(a) impregnating a porous carbon-containing component part with orthophosphoric acid to substantially fill the pores thereof with said orthophosphoric acid;

(b) drying said component part until the moisture is completely removed from the pores of the carbon-containing material;

(c) further impregnating the thus orthophosphoric acid-impregnated component part with an organoelement com-

pound based on an element selected from the group consisting of Si, Ti, and Al, which organoelement compound is capable of reacting with orthophosphoric acid to form phosphates of said elements; and

(d) heating the thus further impregnated component part to a temperature at which said organoelement compound reacts with orthophosphoric acid to form the corresponding phosphates, said phosphates being formed both in the pores and on the surface of the carbon-containing material.

2. The method of claim 1, wherein the further impregnation of the component parts is effected with solutions of silicon organic polymers in organic solvents.

4,292,346

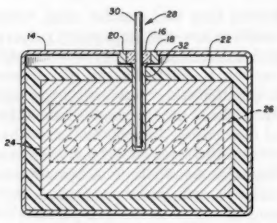
LITHIUM-HALOGEN BATTERIES

Lee F. Athearn, Fridley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 20,809, Mar. 15, 1979, Pat. No. 4,212,930. This application Aug. 22, 1979, Ser. No. 68,872

Int. Cl.³ B05D *5/12;* **H01M** *2/26*

U.S. Cl. 427—115 **6 Claims**



1. In the method of preparing a lithium electrode having a lithium coated electrical lead attached thereto, the steps of:

providing an electrode collector having an electrical lead attached thereto, and

dipping the collector and a substantial portion of the lead, extending from the collector, into molten lithium to provide a lithium coating thereon.

4,292,347

PYROLYTIC COATING REACTANT FOR DEFECT AND DURABILITY CONTROL

Harold E. Donley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 3, 1979, Ser. No. 99,459

Int. Cl.³ C03C *17/25*

U.S. Cl. 427—168 **9 Claims**

1. A method for coating glass with a durable metal oxide film which comprises contacting the glass at a temperature sufficient to thermally decompose metal diketonates and carboxylates to the corresponding metal oxides with a composition comprising in combination:

a. a metal diketonate capable of thermal decomposition to the oxide of said metal; and

b. a metal carboxylate capable of thermal decomposition to the oxide of said metal wherein said metals are independently selected from the group consisting of a single metal and a mixture of metals.

4,292,348

LOW DENSITY CERAMIC INSULATING

Calvin M. Dolan, King of Prussia, Pa., assignor to Johnson Matthey, Inc., Malvern, Pa.

Filed Jan. 14, 1980, Ser. No. 112,106

Int. Cl.³ B05D *3/00, 1/28, 3/12;* **B01J** *35/00*

U.S. Cl. 427—299 **9 Claims**

1. A method of preparing an insulating system for a catalyst to be packed in a can, said method consisting essentially of the steps of

(a) applying a thin coat of low viscosity ceramic inorganic fiber formulation with about 5% rigidizer to a clean, dry substrate or catalyst to wet the surface thereof to facilitate adhesion, the ceramic inorganic fiber formulation having a viscosity of about 483–1197 centipoise at 21.1° C.;

(b) producing a high viscosity ceramic inorganic fiber formulation by mixing about 3–10% hollow silica microspheres with the low viscosity ceramic inorganic fiber formulation, the high viscosity formulation having a viscosity of about 96,000–336,000 centipoise at 21.1° C.;

(c) applying a single coat of the high viscosity ceramic inorganic fiber formulation to the thin coated substrate or catalyst to provide a ceramic inorganic fiber formulation having sufficient thickness to provide the necessary insulation; and

(d) drying the coated substrate or catalyst.

2. A method of preparing a catalyst to be packed in a can, said method consisting essentially of the steps of

(a) applying a thin coat of low viscosity ceramic inorganic fiber formulation with about 5% rigidizer to a clean, dry substrate or catalyst at about room temperature to wet the surface thereof to facilitate adhesion, the ceramic inorganic fiber formulation having a viscosity of about 483–1197 centipoise at 21.1° C.;

(b) producing a high viscosity ceramic inorganic fiber formulation by mixing about 2% hollow silica microspheres with the low viscosity ceramic inorganic fiber formulation, the high viscosity formulation having a viscosity of about 60,000 to 100,000 centipoise at 21.1° C.;

(c) applying a plurality of coats of high viscosity ceramic inorganic fiber formulation to the thin coated substrate or catalyst until a coating thickness sufficient to provide the necessary insulating is produced; and

(d) drying each coat after application thereof.

7. A method as recited in claim 1 or 2 wherein the substrate or catalyst has been cleaned by glass bead blasting or with Zirconia before step (a) is practiced.

4,292,349

COATING METHOD AND APPARATUS

Mamoru Ishiwata; Shinji Uematsu; Kazuo Ozaki, and Masashi Ishiyama, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 30, 1979, Ser. No. 99,232

Claims priority, application Japan, Dec. 6, 1978, 53-151222

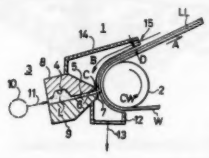
Int. Cl.³ B05D *3/10*

U.S. Cl. 427—335 **11 Claims**

1. A method for applying a film forming material including a coating liquid having an organic solvent of high volatility directly or through other coated films to a web which is continuously conveyed, comprising the steps of forming a coated film on said web by applying said coating liquid thereto by means of an extrusion-type hopper while changing the direction of conveyance of said web in a range of from a substantially horizontal direction to a substantially vertical direction by a coating backing roll, collecting, by means of a hood, evaporated gas of the organic solvent from said coating liquid

which flows out of said hopper in a region where a three-phase, solid-phase, liquid-phase and gas-phase interface exists around the upper surface of said hopper and at a coating point, and suppressing, by means of said hood, gas evaporation in said region with evaporated gas of said organic solvent from said coated film which is moving in said vertical direction from said coating point, thereby to prevent the occurrence of stripe-like defects due to solidification of said coating liquid in said region and to stably carry out the coating operation.

2. A coating apparatus for applying a film forming material including a coating liquid having an organic solvent of high volatility to a web comprising: a backing roll for moving a web to which a coating liquid is to be applied while changing the



direction of conveyance of said web; a hopper in which at least the flow path of said coating liquid from a metering pump to a slot outlet is of a completely closed system; and a hood for covering a region and a volume above said region which is on said web downstream of a coating point which is formed by said coating liquid bridged between an edge of said hopper and said web and in which region a three-phase, solid-phase, liquid-phase and gas-phase, interface exists, said hood being adapted for collecting gas from organic solvent evaporation from said coating liquid and coated film in said region where said three-phase interface exists, said evaporation gas thus collected being utilized to prevent solidification of said coating liquid to perform a stable coating operation.

4,292,350

ISOCYANATE MIXTURE AND ITS USE AS BINDER IN ONE-COMPONENT LACQUERS

Werner Kubitza; Gerhard Mennicken, both of Leverkusen, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 12, 1979, Ser. No. 84,021

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845514

Int. Cl.³ C08L *75/04*

U.S. Cl. 427—385.5 **7 Claims**

1. An isocyanate mixture suitable for use as a binder for one-component lacquers, which mixture is stable in storage in the absence of moisture and is cross-linked by moisture with the formation of urea groups and has a solvent-free viscosity measured in a DIN cup 4 according to DIN 53 211 of from about 30 to 200 seconds and contains a maximum of about 0.7% by weight of

readily volatile organic diisocyanates, comprising a mixture of:

(a) at least one lacquer polyisocyanate containing biuret, urethane and/or isocyanurate groups and having an average isocyanate functionality greater than 2 and an isocyanate content of from about 13 to 30% by weight and

(b) at least one monoisocyanate corresponding to the following general formula:

$$R_1—O—CO—NH—R_2—NCO$$

wherein

R_1 represents a hydrocarbon group having from 1 to 18 carbon atoms optionally interrupted by ether bridges and

R_2 represents a group such as is obtained by removal of the isocyanate groups from an aliphatic, cycloaliphatic, araliphatic or aromatic diisocyanate having a molecular weight of from about 140 to 300,

the proportion by weight of component (a) to component (b) being from about 2:1 to 5:1, and the average isocyanate functionality of the mixture being greater than about 1.8.

4,292,351

METHOD OF BLASTING CONCRETE

Yasuro Ito, 4-38-16, Numabukuro, Nakano-Ku, Tokyo; Yoshiro Higuchi, Tokyo; Yutaka Mochida, Hakodate; Hideharu Kaga, Tokyo; Yasuhiro Yamamoto, Kawasaki, and Tadayuki Sumita, Tokyo, all of Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Filed Apr. 20, 1979, Ser. No. 31,930

Claims priority, application Japan, Apr. 28, 1978, 53-50060; Nov. 17, 1978, 53-141203

Int. Cl.³ B05D *1/02*

U.S. Cl. 427—403 **19 Claims**

1. A method of blasting concrete or mortar against a surface to be coated utilizing a blasting nozzle which comprises the steps of preparing a slurry-like freshly mixed fluid composition by admixing a powder of hydraulic substance and water, conveying said slurry-like freshly mixed fluid composition to a remote location through a conduit, under pressure, conveying an aggregate through a separate conduit to said remote location under pressure, combining said slurry-like composition and said aggregate at said remote location by introducing said slurry-like composition into the conduit conveying said aggregate to form a unified mixture and conveying said mixture through a common conduit to said blasting nozzle, and blasting said unified mixture against the surface to be coated, said unified mixture being formed substantially immediately before said blasting nozzle.

4,292,352

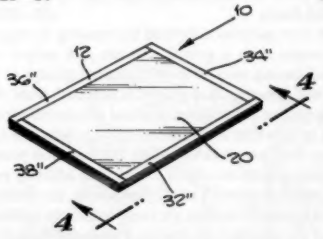
REMOVABLE GLASS DESK PAD

Larry Singer, 1758 S. Preuss Rd., Los Angeles, Calif. 90035

Filed Feb. 11, 1980, Ser. No. 120,042

Int. Cl.³ A47G *1/06, 23/03*

U.S. Cl. 428—14 **6 Claims**



1. An improved removable glass desk pad comprising:

a. a rectangular base member;

b. a rectangular border member rigidly attached to one surface of said base member;

c. said rectangular border member constructed of multiple layers wherein the lowermost layer consists of four elongated sections of equal width arranged so that one widthwise portion of each section abuts and is perpendicular to the lengthwise portion of an adjacent section such that the four sections form a rectangle whose outer circumference is aligned with the circumference of said base member, wherein the second layer of four sections is arranged so that each section is aligned with the corresponding section directly beneath it but offset in its lengthwise direction by a distance equivalent to the width of the section, wherein the four sections of the third layer are in direct alignment with the four sections of the lowermost layer, and each successive layer is so arranged that the four sections of that layer are in direct alignment with the four sections of

the layer two levels below, such that a rectangular border is formed wherein the circumference of the outer edge of the layers of sections is aligned with the circumference of said base member and the inner edge of the layer of sections combine to form a recessed area within the central portion of said desk pad;

d. said lowermost layer of sections being rigidly attached to said base member and each successive layer of sections being rigidly attached to the corresponding layer of sections directly beneath it; and

e. a glass plate removably placed on top of said base member and within said recess created by said rectangular border member such that the circumference of the glass plate is only slightly smaller than the inner circumference of said rectangular border member.

4,292,353

URETHANE MODIFIED POLYISOCYANURATE FOAM SURFACED WITH ALUMINUM FOIL OR SHEET

Takashi Ohashi, Iruma; Toru Okuyama, Sagamihara; Akira Suzuki, Hidaka; Katsuhiko Arai, Higashimurayama; Minoru Kojima, Ohme; Yoshiko Taniguchi, Higashimurayama; Masako Yoshida, Kodaira; Ryozo Sakata, Higashiyamato; Hideki Sugihara, Miura-Gun; Masashi Dobashi, Yokohama, and Hirobumi Ohwada, Kamakura, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,811

Claims priority, application Japan, Nov. 14, 1977, 52-135614

Int. Cl.³ B32B *5/20*

U.S. Cl. 428—211 **13 Claims**

1. A laminate consisting essentially of (1) an urethane modified polyisocyanurate foam as a single core material and (2) a surface material piled on one or both surfaces of the foam, wherein

(a) said surface material is an aluminum foil or sheet having a thickness of not less than 0.1 mm, said surface material being piled on said core material through a self-adhesion of said foam;

(b) said core material is formed by reacting an organic polyisocyanate with a polyol wherein said polyol is a compound having two or more hydroxyl groups at its terminal, and wherein said polyol is selected from the group consisting of the addition product of a polyhydric alcohol with an alkylene oxide, the addition product of an alkanol amine with an alkylene oxide, the addition product of a polyamine with an alkylene oxide, the addition product of phosphoric acid with an alkylene oxide, the addition product of a phenol with an alkylene oxide, the addition product of an intermediate having a phenolic hydroxyl group with an alkylene oxide, a mixture of a polyhydric alcohol and a polyether polyol, and any combination of the above polyols, and wherein said polyol has a hydroxyl equivalent of 200 to 2,000 in an amount of 0.05 to 0.13 equivalent of said polyol to said organic polyisocyanate in the presence of

(1) an isocyanate trimerization catalyst selected from the group consisting of an alkali metal salt of a carboxylic acid having a carbon number of 2–12 and a combination of a tertiary amino compound and said alkali metal salt;

(2) a blowing agent; and, optionally

(3) a foam stabilizer or

(4) other additives;

(c) said laminate passes Grade 2 incombustibility (quasi-incombustible material) according to JIS A-1321 combustion test.

13. A laminate as claimed in claim **1**, wherein the aluminum foil or sheet is subjected to an anodic oxidation, a coating or a sticking of printed decorative paper.

4,292,354

MOLDINGS FOR AUTOMOBILES

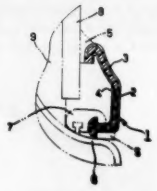
Hisanori Katoh, Tokyo, Japan, assignor to Inoue Gomu Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 21, 1978, Ser. No. 944,306

Claims priority, application Japan, Mar. 31, 1978, 53/42503[U]

Int. Cl.³ B32B *15/08;* **B60R** *13/02*

U.S. Cl. 428—31 **12 Claims**



1. A molding for automobiles comprising:

a base made of synthetic resin;

a stainless foil layer integrally formed on the outer surface of said base, and

oil proof protective layer means selected from the group consisting of polyvinyl chloride resin, cellulose acetate resin, cellulose butyrate resin and cellulose acetate-butyrate resin, integrally formed on the backside of said base for preventing solvent from contacting the backside of said base, wherein the thickness of said base is greater than the thickness of said foil layer or said protective layer means.

4,292,355

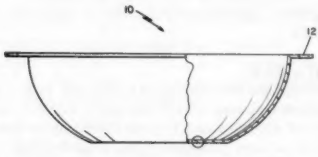
MOISTURE-IMPERVIOUS COEXTRUDED CONTAINER

Laszlo J. Bonis, Swampscott, Mass., assignor to Composite Container Corporation, Medford, Mass.

Filed Jun. 18, 1979, Ser. No. 49,482

Int. Cl.³ B65D *11/00*

U.S. Cl. 428—35 **7 Claims**



1. A moisture impervious plastic container, with a wall comprising

a layer of polypropylene and

a layer of butadiene-styrene polymer directly adhered by coextrusion, without an intervening layer, to said polypropylene layer,

neither of said layers containing any adhesive material mixed therewith for the purpose of adhering said layers together,

adhesion between said layers being provided solely by interaction between said polypropylene and butadiene-styrene polymer,

said polypropylene layer being sufficiently thick to provide a moisture barrier in said wall, and

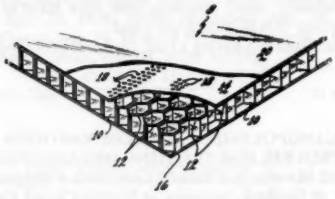
said butadiene-styrene polymer layer being sufficiently thick to permit thermoforming of said container from a sheet comprised of said two layers.

4,292,356

METHOD OF MANUFACTURING OF HONEYCOMB NOISE ATTENUATION STRUCTURE AND THE STRUCTURE RESULTING FROM THE METHOD

Christopher E. Whitemore, Riverside, and Robert M. Carrillo, San Bernardino, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jul. 6, 1979, Ser. No. 55,681
Int. Cl.[3] B32B *3/12*
U.S. Cl. 428—116 8 Claims



1. A method of manufacturing an acoustic panel having a central cellular core portion with a plurality of endwise directed cells sandwiched between an imperforate sheet and a perforate sheet, said perforate sheet having a layer of porous fibrous material bonded to its surface remote from said central cellular core portion, said acoustic panel utilized in a severe environment in which at least the porous fibrous material is exposed to a high speed gas flow therealong, said acoustic panel is exposed to wide temperature gradients and is capable of reducing a broad range of sound frequencies exposed thereto, said method comprising the steps of:

(a) cleaning the surfaces of said central cellular core, imperforate sheet and at least the perforation exposed side of a combined sheet of perforate and porous fibrous materials;

(b) providing a layer of adhesive material between said imperforate sheet and said central cellular core and between said central cellular core and the perforation exposed surface of said combined sheet of perforate and porous fibrous material;

(c) securing together the adhesive coated components; and

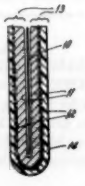
(d) venting the cells of said central cellular core through said layer of porous fibrous material and said perforated sheet while secured together during curing.

4,292,357

ZINC/ZINC OXIDE LAMINATED ANODE ASSEMBLY

Lester R. Erisman, and Robert A. Brown, both of Joplin, Mo., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Jul. 25, 1979, Ser. No. 60,355
Int. Cl.[3] B32B *3/04, 3/24;* H01M *4/42, 4/74*
U.S. Cl. 428—124 23 Claims



1. A zinc anode comprising a series of parallel layers including

a central layer of electrolyte-absorptive inert material which in use forms an internal electrolyte reservoir,

said central layer of inert material disposed between two active elements each including,

a foraminous current collector,

each current collector having on at least one side thereof a zinc or zinc oxide active layer in electrical contact with the current collector,

a zinc or zinc oxide active layer on the respective current collectors being adjacent the central layer.

4,292,358

HEAT PROTECTIVE BARRIER COMPRISING APERTURED MEMBER HAVING INTUMESCENT COATING

Kevin C. Fryer, Feltham, and Edgar C. Prentice, London, both of England, assignors to Blevex Limited, Borehamwood, England

Filed Nov. 2, 1979, Ser. No. 90,808
Claims priority, application United Kingdom, Nov. 2, 1978, 42943/78; Nov. 23, 1978, 45786/78; Feb. 19, 1979, 05698/79; Mar. 27, 1979, 10628/79
Int. Cl.[3] B32B *3/24, 5/20, 15/04*
U.S. Cl. 428—135 18 Claims

1. A heat resistant and protective barrier having at least one layer, said at least one layer comprising: a free and unattached carrier substrate in the form of a sheet material having a plurality of spaced-apart strands defining therebetween a plurality of apertures, and a heat actuated and resistive intumescent coating disposed on said substrate, said substrate comprising the sole supporting means for said intumescent coating.

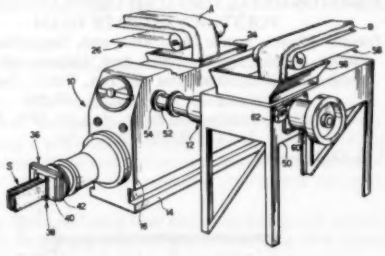
13. A method of forming a heat barrier, said method comprising: coating a free and unattached carrier substrate in the form of a sheet material having a plurality of spaced-apart strands defining therebetween a plurality of apertures with a heat actuated and resistive intumescent material, said substrate comprising the sole supporting means for said intumescent coating.

4,292,359

PROCESS FOR THE CONTINUOUS PRODUCTION OF A PARTLY FINISHED CLAY PRODUCT

Luigi Mosso, Santena, Italy, assignor to Laria-Laterizi Rivestimenti ed Affini-S.p.A., Santena, Italy

Filed Jan. 9, 1980, Ser. No. 110,725
Claims priority, application Italy, Jan. 24, 1979, 67153 A/79
Int. Cl.[3] A23G *1/20*
U.S. Cl. 428—151 7 Claims



1. A process for producing partly finished clay tiles in the form of a pair of facing strips joined together by longitudinally extending frangible bridges comprising:

(a) feeding continuously a first clay to a first screw extruder having first and second screw conveyors in series with one another and a degasing chamber disposed intermediate said first and second screw conveyors,

(b) feeding intermittently a second clay having a different color into said degasing chamber by means of a second screw extruder for variable time intervals which are separated by variable non-feeding time intervals,

(c) imparting a rotory motion to the mixture of said first and second clays by means of said second screw conveyer to swirl said mixture,

(d) extruding the swirled mixture through an extrusion head

on said first extruder to form a pair of continuous strips joined together by longitudinally extending bridges, and

(e) cutting from each continuous strip at the output of said extrusion head a longitudinally extending layer having a width equal to the width of said strip and a substantial thickness to provide colored stripes on the surface of the remaining portion of each strip resembling a natural wood grain.

4,292,360

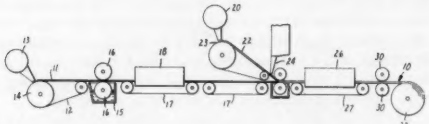
PRESSURE SENSITIVE ADHESIVE TAPE

John E. Riedel, White Bear Lake, and Paul G. Cheney, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 5, 1980, Ser. No. 127,390

Int. Cl.³ B32B *7/04, 5/22, 31/08*

U.S. Cl. 428—171 **11 Claims**



1. A conformable pressure-sensitive adhesive tape comprised of a sheet material and a pressure-sensitive adhesive thereon, said sheet material comprising a first layer of a nonwoven web of randomly interlaced fibers, bonded to each other by a rewettable binder dispersed therethrough, and at least one additional layer comprising a nonwoven web of randomly interlaced fibers having a rewettable binder dispersed therethrough, said fiber of said additional layer being laid directly on said first layer prior to adding said binder to said additional layer whereby said binder in said additional layer bonds the interlaced fibers of said additional layer to each other and to the fibers of said first layer whereby said layers are not readily separable across their common surfaces.

4,292,361

ASBESTOS-METAL SURFACED URETHANE MODIFIED POLYISOCYANURATE FOAM

Takashi Ohashi, Iruma; Toru Okuyama, Sagamihara; Akira Suzuki, Hidaka, and Katsuhiko Arai, Akigawa, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1979, Ser. No. 68,289

Claims priority, application Japan, Aug. 18, 1978, 53/100775

Int. Cl.³ B32B *5/20, 15/04*

U.S. Cl. 428—215 **16 Claims**

1. A fireproof laminate comprising a urethane modified polyisocyanurate foam as a single core material and surface materials piled on both sides of the foam, and passing Grade 2 incombustibility according to Japanese Industrial Standard (JIS) A-1321 combustion test, which comprises:

(a) an asbestos paper having a thickness of 0.1 to 0.5 mm lined with a metal foil having a thickness of less than 0.1 mm as a front surface material for said core material, said asbestos paper being united with said core material through said metal foil by self-adhesion of said foam;

(b) an aluminum foil having a thickness of not more than 0.1 mm as a back surface material for said core material;

(c) as said core material, a urethane modified polyisocyanurate with a polyol having a hydroxyl equivalent of 30 to 2,000 in an amount of 0.05 to 0.5 equivalent per isocyanate group of said organic polyisocyanate in the presence of an isocyanate polymerization catalyst selected from the group consisting of alkali metal salts of carboxylic acids having 2 to 12 carbon atoms and combinations with a tertiary amino compound thereof, a blowing agent and, if necessary, other additives, said core material having a density of 0.02–0.04 g/cm^3; and

(d) said laminate having a total thickness of not more than 30 mm.

4,292,362

ORGANOPOLYSILOXANE COMPOSITIONS AND A PROCESS FOR TREATING ORGANIC FIBERS

Heinrich Marwitz, and Eckhart Louis, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 782,124, Mar. 28, 1977, abandoned. This application Jan. 19, 1978, Ser. No. 870,909

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2615078

Int. Cl.³ B32B *7/00, 17/00;* **B05D** *3/02*

U.S. Cl. 428—245 **10 Claims**

1. A process for treating organic fibers which comprises applying to the organic fibers an organopolysiloxane composition which can be stored under substantially anhydrous conditions, but when exposed to moisture cures to a solid consisting essentially of:

(A) a diorganopolysiloxane having terminal Si-bonded hydroxyl groups;

(B) an organosilicon compound selected from the group consisting of organosilanes of the formula $RSiR'_nX_{3-n}$, in which R is a monovalent radical having at least two amino groups which are bonded to silicon via silicon-carbon bonds, R′ is selected from the group consisting of an alkyl and aryl radical, X is selected from the group consisting of alkyl and substituted alkyl radicals having from 1 to 14 carbon atoms per radical which are bonded to silicon via oxygen, n is 0 or 1, partial hydrolysates of said organosilanes and mixtures thereof and

(C) an organosilane other than (B) having the formula $R''Si(ON{=}CX)_3$, where R″ is selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and X is selected from the group consisting of R″$_2$, a bivalent hydrocarbon radical and a halogenated hydrocarbon radical and an organic solvent, and thereafter curing the composition on the organic fibers.

10. The product obtained from the process of claim **1**.

4,292,363

REINFORCED FOAM LAMINATES AND A PROCESS FOR THEIR MANUFACTURE

Peter J. Briggs, Cheadle Hulme, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 14, 1980, Ser. No. 139,676

Claims priority, application United Kingdom, May 31, 1979, 18922/79

Int. Cl.³ B32B *5/02, 5/20, 5/28;* **B29D** *7/04*

U.S. Cl. 428—247 **10 Claims**

1. A laminated panel comprising a core of rigid isocyanurate-based foam sandwiched between two facing sheets characterized in that a mesh of continuous glass fiber strands readily permeable to the foam forming ingredients is embedded in multiple layers substantially throughout the thickness of the foam core, the whole being bonded together by the foam core into a unitary construction.

4,292,364

MULTI-LAYER BOARD

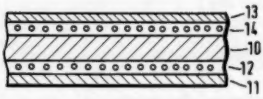
Ludwig Wesch, Heibelberg, and Adolf Meyer, Leimen-Lingental, both of Fed. Rep. of Germany, assignors to Heidelberger Zement Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 893,257, Apr. 5, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,780

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718626; Austria, Apr. 13, 1978, 2581/78; Switzerland, Apr. 14, 1978, 4014/78; Spain, Apr. 22, 1978, 469063; United Kingdom, Apr. 22, 1978, 10751/78; Japan, Apr. 24, 1978, 53-49189; France, Apr. 26, 1978, 78 2321; Netherlands, Oct. 26, 1978, 7810667; Canada, Oct. 31, 1978, 315251

Int. Cl.³ B32B *13/12, 13/14*

U.S. Cl. 428—286 21 Claims



1. A multi-layer load-bearing board comprising at least three layers of different composition, including

(a) basic layer comprised of a cementitious inorganic material,

(b) a cover layer subjectable to mechanical forces and consisting of a fiber-reinforced organic plastic and

(c) an intermediate layer of a hydrophilic resin dilutable or miscible with water interconnecting the basic layer and cover layer in a force-transmitting manner.

4,292,365

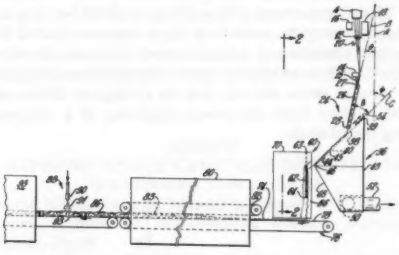
POLYMERIC MATS HAVING CONTINUOUS FILAMENTS WITH AN ASYMMETRICAL CROSS-SECTIONAL SHAPE

John L. Kane, and Vikas M. Nadkarni, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 21, 1980, Ser. No. 113,995

Int. Cl.³ D04H *1/58*

U.S. Cl. 428—288 9 Claims



1. A lofted mat comprising a plurality of continuous polymeric filaments having an asymmetrical cross-sectional shape, the cross-sectional shape having a major dimension within the range from about 0.00150 inch to about 0.00350 inch, the filaments having a crimp factor within the range from about 0.1 to about 4 waves per inch of filament, said mat having a density within the range from about 0.33 pounds per cubic foot to about 1.74 pounds per cubic foot.

4,292,366

MACHINE DEGRADABLE REINFORCED PAPER BARRIER MATERIAL

Cyrus B. Fulton, Jr., 108 Walter Davis Dr., Birmingham, Ala. 35209

Filed Feb. 28, 1980, Ser. No. 125,546

Int. Cl.³ B32B *5/10, 29/00*

U.S. Cl. 428—293 2 Claims

1. A machine degradable reinforced paper barrier material comprising:

(a) at least two laminar sheets of paper mounted in face-to-face relationship to each other,

(b) a plurality of machine degradable and biodegradable reinforcing strands of repulpable twisted paper between said sheets, and

(c) adhesive means between said sheets adhering said sheets to each other and to said reinforcing strands.

4,292,367

PATTERNED TEXTILE MATERIAL

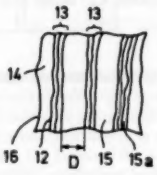
Günter Tesch, Fribourg, Switzerland, assignor to Breveteam S.A., Fribourg, Switzerland

Filed Jan. 3, 1980, Ser. No. 109,303

Claims priority, application Switzerland, Jan. 9, 1979, 158/79

Int. Cl.³ B32B *5/06*

U.S. Cl. 428—300 18 Claims



1. A textile material, comprising in combination:

a carrier,

an outer layer composed of individual endless threads, mounted on, and covering a portion of said carrier, and forming a predetermined design thereon, leaving visible the remainder of said carrier, said threads being separated from one another by respective prearranged distances, and

holding fibers, including fiber pieces emanating and projecting from at least some of said threads, said fiber pieces attaching said layer to said carrier by active needling.

4,292,368

PROCESS FOR MAKING A CONNECTING ROD FOR CONTROLLING OR TRANSMITTING EFFORTS, AND CONNECTING ROD THUS OBTAINED

Jacques Mialon, Vitrolles, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 9, 1980, Ser. No. 110,662

Claims priority, application Fran[illegible], Jan. 15, 1979, 79 00863

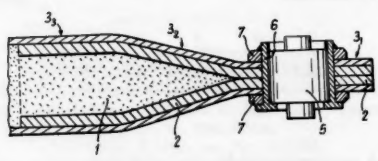
Int. Cl.³ F16C *3/02*; [illegible]H *81/00*

U.S. Cl. 428—310 8 Claims

1. A process for making a connecting rod provided with a connecting member on at least one of its ends, comprising the steps of:

forming a tubular element by winding high strength fibers

impregnated with polymerizable resin on a light, rigid, deformable, cylindrical solid mandrel having a length not greater than the length of said connecting rod, said mandrel having, adjacent at least one of its ends, a section of smaller diameter than the remainder thereof, said winding extending over said section;



flattening said tube at said one end of said mandrel so that is is obturated,

polymerizing said resin impregnating said fibers in the presence of said mandrel to form a hardened tubular element having a flattened end; and

arranging said connecting member in said hardened, flattened end of said tubular element.

4,292,369

FIREPROOF LAMINATES

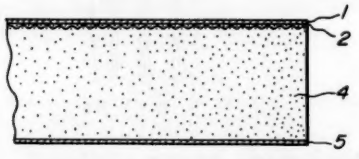
Takashi Ohashi, Iruma; Toru Okuyama, Sagamihara; Katsuhiko Arai, Akigawa, and Hiroshi Kaneda, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 6, 1980, Ser. No. 127,668

Claims priority, application Japan, Mar. 6, 1979, 54-26043; Nov. 30, 1979, 54-154196

Int. Cl.³ B32B *5/20*

U.S. Cl. 428—313 **15 Claims**



1. A fireproof laminate comprising a urethane modified polyisocyanurate foam as a core material and a surface material piled on at least one side of the foam, which comprises:

(1) an aluminum foil having a thickness of not less than 0.015 mm, as a surface material for said core material, said surface material being united with said core material by self-adhesion of said urethane modified polyisocyanurate foam; and

(2) a matted or woven glass fiber interposed between said core material and said front surface material; said urethane modified polyisocyanurate foam being obtained by reacting an organic polyisocyanate with a polyol in the presence of an isocyanate trimerization catalyst, a blowing agent and other additives, provided that

(1) said polyol being a combination of (a) a low molecular weight diol having a hydroxyl equivalent of not more than 100 selected from diethylene glycol, triethylene glycol, tetraethylene glycol, dipropylene glycol, tripropylene glycol, 2,3-butane diol and 2-butene-1,4-diol and (b) at least one high molecular weight polyol having a hydroxyl equivalent of 600–2,000 and 2 to 4 hydroxyl groups in its molecule;

(2) the weight ratio of said low molecular weight diol to said high molecular weight polyols being 0.55 to 7.0; and

(3) said polyol being used in a total amount of 12.5 to 25 parts by weight per 100 parts by weight of said organic polyisocyanate.

4,292,370

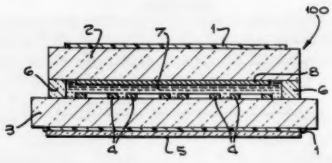
MOISTURE AND TEMPERATURE RESISTANT POLARIZING LAMINATION

John A. Pekko, Whittier, Calif., assignor to Avery International Corporation, San Marino, Calif.

Filed Dec. 6, 1979, Ser. No. 100,933

Int. Cl.³ G02F *1/13*

U.S. Cl. 428—355 **3 Claims**



1. A moisture resistant lamination comprising:

a polyvinyl alcohol polarizing film;

protective polypropylene films on both sides of said polyvinyl alcohol polarizing film; and

transparent urethane bonding agent layers firmly bonding said polypropylene films to the two sides of said polarizing film.

4,292,371

ASPHALT COMPOSITIONS MODIFIED WITH ORGANO SILANE COMPOUNDS

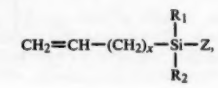
Alfred Marzocchi; Michael G. Roberts, and Charles E. Bolen, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 66,207, Aug. 13, 1979, Pat. No. 4,243,426, which is a continuation-in-part of Ser. No. 852,772, Nov. 18, 1977, abandoned. This application Mar. 24, 1980, Ser. No. 133,170

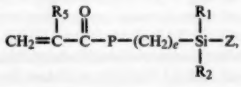
Int. Cl.³ B32B *17/04*; D02G *3/00*

U.S. Cl. 428—378 **4 Claims**

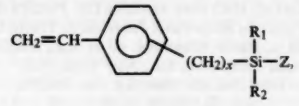
1. Glass fibers coated with a silicon-modified bitumen composition prepared by reaction of (1) a bitumen selected from the group consisting of a bitumen and a bitumen chemically modified with a modifying agent selected from the group consisting of steam and air, and (2) an organo silicon compound selected from the group consisting of a compound having the formula:



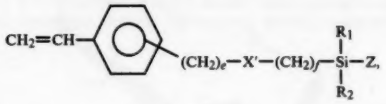
a compound having the formula:



a compound having the formula:



and a compound having the formula:



wherein x is 0 or an integer from 1–3, Z is a readily hydrolyzable group; R_1 and R_2 are selected from the group consisting of Z and a non-hydrolyzable organic group; R_5 is hydrogen or methyl; P is O or —NH—; e is an integer from 2–6, wherein X' is —NH— or —NH—$(CH_2)_e$—NH— and f is an integer from 2 to 6, and the hydrolysis products of said organo silicon compound, in the presence of a catalyst to promote the reaction between the ethylenic unsaturation of said organo silicon compound with ethylenic unsaturation in the bitumen.

4,292,372
POLYVINYLBUTYRAL SHEETING

Robert E. Moynihan, Lowell, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 2, 1980, Ser. No. 155,221
Int. Cl.³ C08F *45/38*; B32B *19/10, 27/42*
U.S. Cl. 428—437 **9 Claims**

8. In a laminar structure comprising at least one layer of glass and a sheet of polyvinyl butyral plasticized with a compatible quantity of at least one hydrolyzable ester selected from the group consisting of triethyleneglycol di-n-heptanoate and tetraethyleneglycol di-n-heptanoate, the improvement wherein the polyvinylbutyral comprises at least one adhesion control agent selected from alkali and alkaline earth metal formates and the polyvinyl butyral sheet has an acid concentration of less than about 10 equivalents of acid per million parts of sheet.

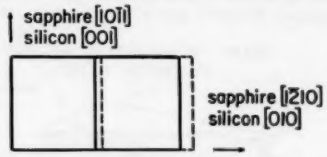
9. In a process for the preparation of PVB sheet by blending polyvinylbutyral, a compatible quantity of at least one hydrolyzable ester plasticizer selected from the group consisting of triethyleneglycol di-n-heptanoate and tetraethyleneglycol di-n-heptanoate and an adhesion control agent, and extruding the blend to form a sheet, the improvement which comprises adding to the blend, as an adhesion control agent, about from 50 to 1500 parts, per million parts of sheeting, of at least one alkali or alkaline earth metal formate in an amount to provide on acid concentration in the sheet of less than about 10 equivalents of acid per million parts of sheet.

4,292,373
SAPPHIRE SINGLE CRYSTAL SUBSTRATE FOR SEMICONDUCTOR DEVICES

Jun-ichi Nishizawa, and Mitsuhiro Kimura, both of Sendai, Japan, assignors to Semiconductor Research Foundation, Sendai, Japan

Division of Ser. No. 947,851, Oct. 2, 1978, abandoned, which is a division of Ser. No. 625,527, Oct. 14, 1975, Pat. No. 4,126,731. This application May 19, 1980, Ser. No. 151,282
Claims priority, application Japan, Oct. 26, 1974, 49-123616
Int. Cl. ³C04B *35/46*; C30B *29/20*; C30B *29/32*
U.S. Cl. 428—446 **15 Claims**

1. A sapphire-containing rhombohedral single crystal substrate for epitaxial growth thereon of a layer of a semiconductor, said single crystal substrate being an electrically insulating material consisting essentially of $MgTiO_3$ in an amount between 56 and 86 mol % with the balance being essentially Al_2O_3, whereby the lattice misfit coefficient between said

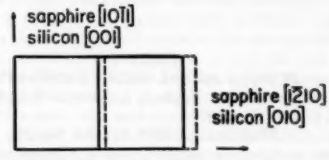


substrate and an epitaxially grown semiconductor thereon is not more than about 1% along the [1011] axis.

4,292,374
SAPPHIRE SINGLE CRYSTAL SUBSTRATE FOR SEMICONDUCTOR DEVICES

Jun-ichi Nishizawa, and Mitsuhiro Kimura, both of Sendai, Japan, assignors to Semiconductor Research Foundation, Sendai, Japan

Division of Ser. No. 947,851, Oct. 2, 1978, abandoned, which is a division of Ser. No. 625,527, Oct. 14, 1975, Pat. No. 4,126,731. This application May 19, 1980, Ser. No. 151,283
Claims priority, application Japan, Oct. 26, 1974, 49-123616
Int. Cl.³ C30B *29/20, 29/22*
U.S. Cl. 428—446 **19 Claims**



1. A sapphire-containing rhombohedral single crystal substrate for epitaxial growth thereon of a layer of a semiconductor, said single crystal substrate being an electrically insulating material consisting essentially of Sc_2O_3 in an amount between 24 and 38 mol % with the balance being essentially Al_2O_3, whereby the lattice misfit coefficient between said substrate and an epitaxially grown semiconductor thereon is not more than about 1% along the [1011] axis.

4,292,375
SUPERPLASTICALLY FORMED DIFFUSION BONDED METALLIC STRUCTURE

William L. Ko, Lancaster, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 30, 1979, Ser. No. 43,944
Int. Cl.³ B32B *3/12*; B64C *1/00, 3/20*
U.S. Cl. 428—593 **5 Claims**

1. A diffusion bonded metallic sandwich structure characterized by an orthogonally corrugated core comprising:

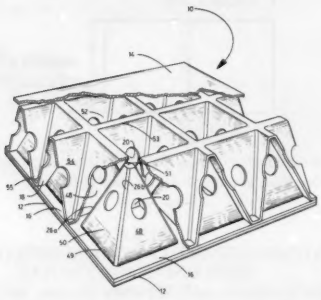
A. a base plate of a planar configuration;

B. a first core member comprising a first core plate seated on said base plate and consisting of a first uniform array of mutually spaced protuberances, each protuberance being of a truncated pyramidical configuration and protruding away from said base plate;

C. a second core member comprising a second core plate seated on said first core member and consisting of a second uniform array of mutually spaced protuberances, each protuberance of said second uniform array being of truncated pyramidical configuration and protruding toward said base plate in a manner such that the protuberances of

said first array are uniformly interspersed with the protuberances of the second array;

D. a cover plate seated on said second core member; and



E. means comprising diffusion welds bonding said plates into an integrated structure.

4,292,376

POROUS METAL SHEET LAMINATE

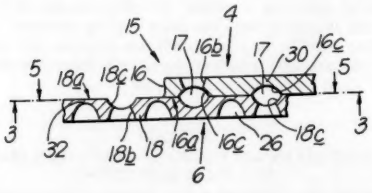
David Hustler, Nelson, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 12, 1979, Ser. No. 84,128

Claims priority, application United Kingdom, Oct. 28, 1978, 42364/78

Int. Cl.³ B32B *15/01*

U.S. Cl. 428—593 **2 Claims**



1. A porous sheet metal laminate for use in environments where the sheet metal laminate is subjected to tensile stresses in a direction co-planar with the sheet metal laminate, said sheet metal laminate having outer surfaces and abutting inner faces and comprising at least two metal sheets permanently joined together along the abutting inner faces thereof, each of said abutting inner faces having a pattern of grooves formed therein and cooperating to define internal channels for the laminate, a plurality of holes in each of said sheets extending from the outer surfaces thereof to said internal channels for providing communication between said internal channels and said outer surfaces of the laminate, and a plurality of blind pockets in at least one of said outer surfaces of said laminate, said pockets being positioned in said at least one of said outer surfaces intermediate said channels so that stress concentrations from said tensile stresses in said laminate are evenly distributed through metal surrounding said holes, channels and blind pockets.

4,292,377

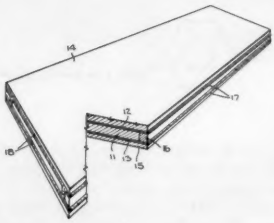
GOLD COLORED LAMINATED COMPOSITE MATERIAL HAVING MAGNETIC PROPERTIES

Walter A. Petersen, Ridgewood; Jonathan A. Travis, Oak Ridge, and Frank A. Badia, Ringwood, all of N.J., assignors to The International Nickel Co., Inc., New York, N.Y.

Filed Jan. 25, 1980, Ser. No. 114,310

Int. Cl.³ B32B *15/04, 15/18*

U.S. Cl. 428—675 **5 Claims**



1. A pressure bonded composite material comprising a multilayered laminate having a central core layer of ferromagnetic metal or alloy selected from the group consisting of nickel, iron and alloys thereof, the core layer representing from about 3.5% to about 85% of the thickness of the composite, a pair of intermediate layers of essentially pure copper, each layer representing from about 1% to about 6% of the thickness of the laminate, each intermediate layer being bonded to a respective one of opposed surfaces of the core, and a pair of gold colored sheathing layers, each of which is bonded remotely from said core to a respective surface of one of said intermediate layers, each layer having a thickness representing from about 5% to 45% of the thickness of the laminate, each of the sheathing layers consisting of an alloy which comprises, by weight: 0.5 to 10% Al, 0 to 9.5% Ni, the balance being copper in an amount of at least 85% and layer edges at least partially welded together to maintain the layers in their superimposed relationship to one another prior to the application of pressure.

4,292,378

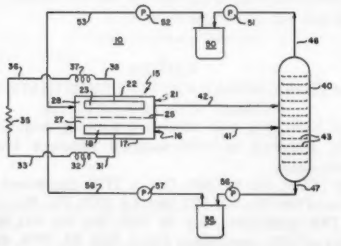
THERMAL REGENERATION OF AN ELECTROCHEMICAL CONCENTRATION CELL

Michael Krumpelt, Naperville, and John K. Bates, Plainfield, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 9, 1980, Ser. No. 148,326

Int. Cl.³ H01M *8/06, 6/36*

U.S. Cl. 429—15 **26 Claims**



1. A system comprising an electrochemical cell having first and second metallic electrodes respectively positioned in contact with first and second electrolytes separated by an ion exchange member, said first and second electrolytes being composed of different concentrations of an ionic solvent and a

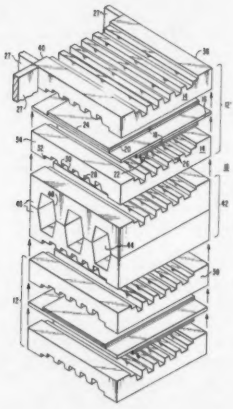
salt having cations of the metallic electrodes, said ionic solvent and said salt in the concentrations of one or said first and second electrolytes forming a complex wherein the free energy of formation of said complex is less than about −5 Kcal/mole, thermal decomposing means for receiving said first and second electrolytes and thermally decomposing the complex whereby producing a first feed material for said first electrolyte having a high concentration of said cations and second feed material for said second electrolyte having a low concentration or none of said cations, and means for recycling the first feed material to said first electrolyte and the second feed material to said second electrolyte, thereby regenerating said electrochemical cell.

4,292,379

VARIABLE AREA FUEL CELL PROCESS CHANNELS

Richard E. Kothmann, Churchill Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1980, Ser. No. 144,088
Int. Cl.³ H01M 8/04
U.S. Cl. 429—17 **11 Claims**



1. An improved fuel cell of the type wherein a fuel is passed through a plurality of fuel channels on one side of an electrolyte from a fuel inlet to a fuel outlet, and an oxidant is passed through a plurality of oxidant channels on the other side of the electrolyte from an oxidant inlet to an oxidant outlet, said fuel and oxidant channels arranged so that one of said fuel channel inlets is positioned closer to said oxidant channel inlets than another one of said fuel channel inlets, and one of said oxidant channel inlets is positioned closer to said fuel channel inlets than another one of said oxidant channel inlets, the improvement comprising:

the flow area of one of said fuel channels being different than the flow area of another one of said fuel channels, and the flow area of one of said oxidant channels being different than the flow area of another one of said oxidant channels.

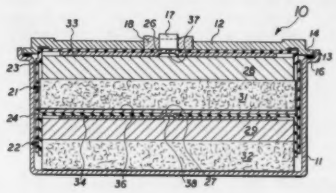
3. A bipolar plate for a fuel cell comprising a plate having a plurality of fuel channels on one side thereof and a plurality of oxidant channels on the opposite side, the size of said fuel channels varying in a predetermined fashion from one to another, and the size of said oxidant channels varying in a predetermined fashion from one to another.

4,292,380

TWO-CELL BATTERY STRUCTURE

Matthew O'Boyle, Timonium, and Ross E. Magladry, Towson, both of Md., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed Oct. 23, 1980, Ser. No. 199,696
Int. Cl.³ H01M 6/18
U.S. Cl. 429—101 **5 Claims**



1. A lithium halide battery comprising:

a. a metal encasing means having a top member sealed thereto, and through which is positioned a terminal and electrically insulated therefrom; and

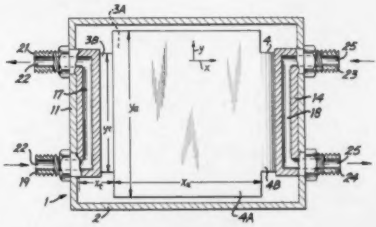
b. first and second cell elements positioned within said encasing means, each of said elements comprising an insulating cup having an opening therethrough, a lithium anode positioned within said cup and a cathode positioned in contact with said anode, the opening in said cup of said first cell element being aligned with said terminal and said cup of said second cell element being positioned within said first cup such that said anode of said second cell is in electrical contact with the cathode of said first cell, said first and second cell elements being positioned within said encasing means such that the anode of said first cell is in electrical contact with said terminal through the opening in the cup of said first cell, and the cathode of said second cell is in electrical contact with said encasing means.

4,292,381

BATTERY CONSTRUCTION FOR UNIFORM ELECTRODE CURRENT DENSITY

Martin G. Klein, Brookfield, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Jan. 30, 1980, Ser. No. 116,772
Int. Cl.³ H01M 2/32, 10/50
U.S. Cl. 429—120 **16 Claims**



1. An electrochemical cell comprising:

a number of positive electrodes, each of said positive electrodes comprising a first plate forming a current collector and having a main area with first and second direction extent and a tab with first direction extent outward of said main area and second direction extent, the tabs of said first plates being arranged in aligned contacting relationship;

a number of negative electrodes, each of said negative electrodes comprising a second plate forming a current collector and having a main area with first and second direction

extent and a tab with first direction extent outward of said main area and second direction extent, the tabs of said second plates being arranged in aligned contacting relationship;

and means for cooling said tabs of said first plates and said second plates, said cooling means including: a first transport means for transporting a cooling medium in the second direction and along the expanse of the face of an exterior tab of said aligned tabs of said first plates; and a second transport means for transporting a cooling medium in the second direction and along the expanse of the face of an exterior tab of said aligned tabs of said second plates.

4,292,382

POSITIVE ACTIVE MATERIAL FOR AN ELECTRIC CELL. A METHOD OF PREPARING THE POSITIVE ACTIVE MATERIAL AND A CELL WHICH USES IT

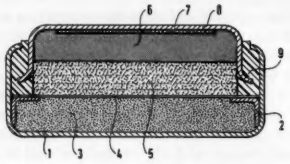
André Lecerf, Pace, and Michel Broussely, Poitiers, both of France, assignors to Saft Leclanche, Poitiers, France

Filed Jun. 9, 1980, Ser. No. 157,893

Claims priority, application France, Jun. 27, 1979, 79 16554

Int. Cl.³ H01M *4/58*

U.S. Cl. 429—197 **5 Claims**



1. An electric cell having a positive electrode which comprises a positive active material, said material consisting of an anhydrous copper borate whose formula is $Cu_3B_2O_6$.

4,292,383

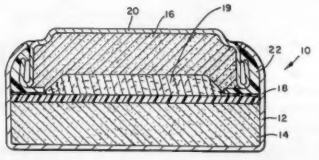
BILEVEL RECHARGEABLE CELL

Ralph Di Palma, New Hyde Park, and Arthur Phillips, White Plains, both of N.Y., assignors to Duracell International Inc., Bethel, Conn.

Continuation of Ser. No. 956,479, Oct. 30, 1978, abandoned. This application Nov. 21, 1979, Ser. No. 96,582

Int. Cl.³ H01M *4/34*

U.S. Cl. 429—219 **8 Claims**



1. A method for improving the rechargeability of an electrochemical cell having an anode, a separator, an electrolyte, and a cathode comprising monovalent silver oxide comprising the steps of admixing with said silver oxide a material selected from the group consisting of mercuric oxide, cadmium oxide, cadmium hydroxide and manganese dioxide; and substantially homogeneously dispersing above about ten percent by weight of the cathode of a metal selected from the group consisting of silver, nickel and a mixture of silver and nickel throughout said cathode; whereby, upon discharging of said cell a stepped decrease in cell voltage occurs and recharging of said said cell can be effected prior to complete discharge of said cathode whereby a matrix of said metal will be maintained in said cathode to improve the rechargeability of said cathode.

4,292,384

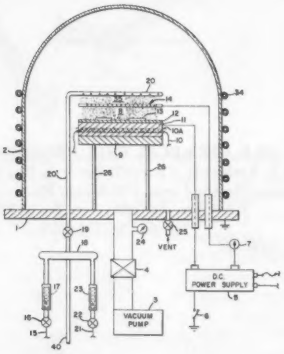
GASEOUS PLASMA DEVELOPING AND ETCHING PROCESS EMPLOYING LOW VOLTAGE DC GENERATION

Virgil E. Straughan, Euclid, and Eugene Wainer, Shaker Hts., both of Ohio, assignors to Horizons Research Incorporated, Cleveland, Ohio

Continuation of Ser. No. 838,297, Sep. 30, 1977, abandoned. This application Jul. 10, 1979, Ser. No. 56,165

Int. Cl.³ G03C *5/00, 5/24*

U.S. Cl. 430—5 **28 Claims**



1. In the processing of silicon wafers in the manufacture of semiconductor devices, wherein the wafers are treated to form an adherent oxide layer on one surface thereof, of a thickness between about 5000 and 10,000 A° and the oxide layer is then coated with a photoresist composition, and said composition is then dried and then exposed to a pattern of radiation and the coated wafers are thereafter heated to fix an image formed in said photoresist, and then the photoresist is then developed, the improvements which comprise:

developing the photoresist by dry means by subjecting the photoresist composition on said wafers to a low pressure oxygen containing atmosphere which has been energized by application of low voltage direct-current to electrodes positioned adjacent said wafers, whereby the areas of said photoresist which were not exposed to said radiation are removed from said wafers by oxidation in a plasma;

and providing as said photoresist composition, a composition which comprises the following materials dissolved in a resin binder;

at least one polymerizable N-vinyl monomer;

at least one photoactivator selected from the group of organic halogen compounds in which at least two halogen atoms are attached to a single carbon atom, sulfonyl halides, and mercapto compounds in which the mercapto group is attached to a carbon atom in a heterocyclic nucleus.

4,292,385

BI-MODAL PHOTORECEPTOR AND METHOD

Robert G. Blanchette, Northfield, and Denis J. Curtin, Chicago, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Sep. 4, 1979, Ser. No. 72,450

Int. Cl.³ G03G *13/044, 5/04, 5/10*

U.S. Cl. 430—58 **8 Claims**

1. A bi-modal photoreceptor comprising a conductive backing, a first charge generative layer on said backing capable of photogenerating and injecting photo excited charge carriers, a

top second charge generative layer formed of a composition containing a polyalkyl carbazole and a sensitizing dyestuff which is characterized by transparency to light of a first band width and is absorptive to a second band width, and an intermediate layer capable of transporting photogenerated charge carriers which is characterized by transparency to the first band width.

4,292,386

PHOTOCONDUCTIVE DRUM WITH PAPER LAYER ATTACHMENT

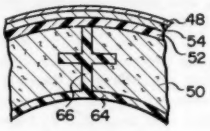
Toshimasa Takano, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 17, 1979, Ser. No. 104,061

Claims priority, application Japan, Dec. 22, 1978, 53-158828; Dec. 22, 1978, 53-176360[U]; Dec. 27, 1978, 53-180564[U]

Int. Cl.³ G03G *5/14*

U.S. Cl. 430—63 **2 Claims**



1. A photosensitive drum for a copying apparatus, comprising:

a hollow cylinder including

a plastic hollow cylinder base;

a projection secured to the outer periphery of the cylinder base extending parallel to the axis of the cylinder base and having a cross-shaped section; and

a rectangular paper sheet rolled about the outer periphery of the cylinder base, the edges of the paper sheet being attached to the projection;

a conductive layer formed on the outer periphery of the hollow cylinder, the conductive layer being fabricated from a synthetic resin containing carbon powder that is partly impregnated into the outer periphery of the hollow cylinder; and

a low resistance layer formed on the outer periphery of the conductive layer; and

a photosensitive layer formed on the outer periphery of the low resistance layer.

4,292,387

MAGNETIC DEVELOPING METHOD UNDER A.C. ELECTRICAL BIAS AND APPARATUS THEREFOR

Junichiro Kanbe, Tokyo; Tsutomu Toyono, Higashi; Nagao Hosono, Chofu, and Tohru Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,435

Claims priority, application Japan, Jul. 28, 1978, 53-92108; Apr. 28, 1979, 54-52640; Jun. 11, 1979, 54-68564

Int. Cl.³ G03G *13/09, 15/09*

U.S. Cl. 430—102 **32 Claims**

1. A dry developing method for developing a latent image comprising the steps of:

defining a developing zone wherein a latent image bearing member having a latent image with an image area and a non-image area, and a non-magnetic conductive member carrying a layer of one component magnetic developer on the surface thereof are disposed in opposed relationship with a clearance between the surface of the latent image bearing member and the surface of the non-magnetic conductive member, the clearance being greater than the thickness of said developer layer so as to create an air gap;

providing a magnetic field in said developing zone;

moving said latent image bearing member and said non-magnetic conductive member; and

imparting an alternating electric field sufficient to produce electric fields across said developing clearance which alternate both in the image area and the non-image area.

4,292,388

IMAGE-FORMING MATERIAL OF ALUMINUM-IRON ALLOY

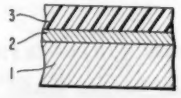
Tomoaki Ikeda; Masamiti Sigyoo; Sadaharu Ikeda; Satoshi Yoshida, and Takeshi Tomotsu, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 685,571, May 12, 1976, abandoned. This application Nov. 14, 1978, Ser. No. 960,547

Claims priority, application Japan, May 12, 1975, 50-56552

Int. Cl.³ G03C *1/94*

U.S. Cl. 430—162 **14 Claims**



1. A metal image-forming material for line work and halftone dot images comprising a base, a resist-forming photosensitive resin layer formed thereon, said photosensitive resin layer comprising a monomer, a prepolymer or a polymer, which, when exposed to radiation, chemically changes in its molecular structure and thereby changes in its solvent solubility, and a layer ranging in the thickness from about 300 A to about 1500 A of an aluminum/iron alloy consisting essentially of aluminum and iron, said alloy containing from about 0.2 to about 10 atomic % of iron, formed between said base and said photosensitive resin layer said alloy being entirely removed in areas where exposed to an etching solution.

4,292,389

PROCESS FOR PREPARING PHOTOSENSITIVE PLATES FOR PRINTING

Hiroshi Kojima; Kunio Ito; Masami Akiyama, and Takeshi Tanaka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1980, Ser. No. 115,124

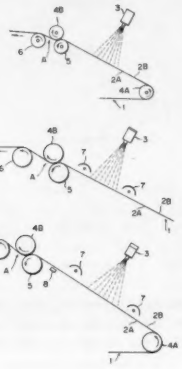
Claims priority, application Japan, Jan. 31, 1979, 54-9186; Mar. 9, 1979, 54-28044; Mar. 9, 1979, 54-28045

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—169 **15 Claims**

1. A process for the production of a photosensitive plate for printing which comprises a photosensitive layer side and a support side having a fine powder fixed to the surface of said photosensitive layer side, which comprises

uniformly dispersing and adhering a heat-depositable fine powder having a constant directional size of 0.5–40μ onto said surface of a photosensitive plate in an amount of 0.005–0.5 g. of the said powder per square meter of the said plate;



preheating said photosensitive plate; and

contacting said surface of said preheated plate to which said powder is adhered with a heating roll to fuse and fix said fine powder to said surface of said plate.

4,292,390

INTEGRAL DIFFUSION TRANSFER PHOTOGRAPHIC FILM UNIT

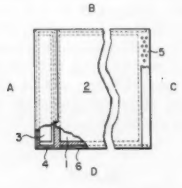
Kazunobu Katoh, and Teruyoshi Makino, both of Minami-asigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 30, 1980, Ser. No. 154,739

Claims priority, application Japan, May 30, 1979, 54-67212

Int. Cl.³ G03C *1/40, 1/76, 1/48*

U.S. Cl. 430—207 **9 Claims**



1. An integral diffusion transfer photographic film unit comprising at least one photosensitive silver halide emulsion layer in association with a dye-image-providing material and an image-receiving layer positioned between two support layers, at least one of said supports being transparent, and also containing a processing composition to be distributed between said two support layers, wherein at least one marginal portion of said integral film unit is masked by a masking material having on a surface facing said integral film unit a pressure-sensitive or heat-sensitive adhesive layer containing an acid or an acid-releasing material.

4,292,391

SILVER HALIDE DEVELOPMENT ACCELERATORS

Joseph D. Overman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

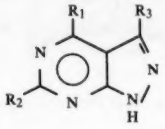
Filed Feb. 6, 1980, Ser. No. 119,296

Int. Cl.³ G03C *5/30*

U.S. Cl. 430—267 **8 Claims**

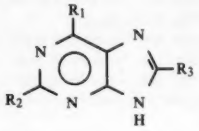
1. In a process for developing a photographic light-sensitive material for the graphic arts which comprises image-wise exposing and infectiously developing a photographic film comprising a support having coated thereon a silver halide emulsion layer, in an infectious developing solution comprising (1) hydroquinone or a hydroquinone derivative, (2) an alkali, (3) an alkali metal bromide, (4) an alkali metal sulfite, (5) an aldehyde/alkali metal bisulfite adduct, and (6) an antifoggant, the improvement comprising incorporating into the emulsion or into the developer an accelerator in amount sufficient to reduce the induction period of said photographic film; said accelerator being a compound selected from the group consisting of:

(a) a pyrazolo pyrimidine of the structure



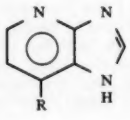
wherein R_1 and R_2=H, OH, or NH_2, with the proviso that when R_1=OH, R_2 must be H or NH_2, and R_3=H or $—O(CH_2)_n—OH$, wherein n is an integer from 1 to 3;

(b) a substituted purine of the structure:



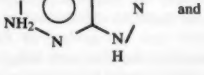
wherein R_1=OH or NH_2; R_2=H, NH_2, or OH with the proviso that when R_1=OH, R_2=H or NH_2, and when R_1=NH_2, R_2=H; R_3=H, OH, NH_2, or CH_3 with the proviso that when R_3=OH, R_1 and R_2 may be OH; when R_3=NH_2, R_1 must be OH and R_2 must be H; and when R_3=CH_3, R_1 and R_2 must be OH.

(c) a 4-aza-benzimidaziole of the structure:



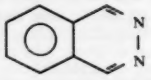
wherein R=H or NH_2;

(d) 8-azaguanine



and

(e) phthalazine



4,292,392

PROTECTIVE LAYER OF FATTY ACID OR NYLON ON PHOTOSENSITIVE RESIN FOR METAL-IMAGE FORMING ELEMENT

Tomoaki Ikeda; Fumiaki Shinozaki, and Sho Nakao, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 17,669, Mar. 5, 1979, abandoned, which is a continuation of Ser. No. 772,044, Feb. 25, 1977, abandoned. This application Oct. 22, 1980, Ser. No. 199,122
Claims priority, application Japan, Feb. 25, 1976, 51-19786
Int. Cl.[3] G03C *1/68*
U.S. Cl. 430—271 23 Claims

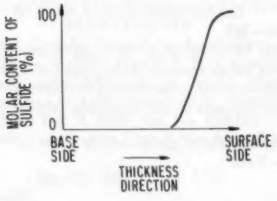
1. A method for producing a metal image which comprises (1) exposing a metal image-forming material comprising a support, a metal layer formed on the support, a photosensitive resin layer formed on the metal layer and a protective layer formed on the photosensitive resin layer, said metal layer being etchable with an aqueous alkaline solution, said photosensitive resin layer being developable with an aqueous alkaline solution and said protective layer being aqueous alkaline solution permeable and consisting essentially of a member selected from the group consisting of a higher fatty acid having 11 to 31 carbon atoms excluding the carbon atom(s) of the carboxyl group(s) thereof or an alcohol-soluble nylon, and (2) developing the exposed photosensitive resin layer to form a resist and etching the metal layer with an aqueous alkaline solution or aqueous alkaline solutions, to thereby form a metal image having a resist layer thereon and said protective layer on said resist layer.

4,292,393

PHOTOSENSITIVE IMAGE FORMING MATERIALS

Minoru Wada; Fumiaki Shinozaki; Yohnosuke Takahashi; Satoshi Yoshida, all of Asaka, and Tomoaki Ikeda, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 14, 1980, Ser. No. 177,963
Claims priority, application Japan, Aug. 14, 1979, 54-103373
Int. Cl.[3] G03C *1/94*
U.S. Cl. 430—275 3 Claims



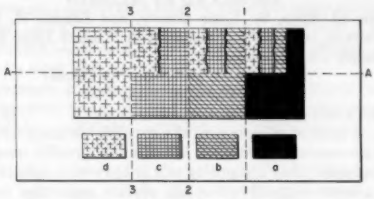
1. A photosensitive image forming material which comprises a photosensitive resin composition layer on a support and an image forming layer comprising a mixture of a metal and a metal sulfide between said support and said photosensitive resin composition layer, wherein the molar ratio of said metal to said metal sulfide is in the range of 20:1 to 2:1.

4,292,394

PROCESS FOR PREPARING MULTICOLOR TONED IMAGES ON A SINGLE PHOTOSENSITIVE LAYER

Victor F. H. Chu, Wilmington, Del., and James Riesenfeld, Basking Ridge, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 959,627, Nov. 13, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 108,839
Int. Cl.[3] G03C *5/00*
U.S. Cl. 430—291 17 Claims



1. Process for the preparation of a multicolor image using a negative-working tonable photosensitive layer which comprises:

(a) exposing said layer imagewise to actinic radiation through an image-bearing transparency, the exposed image areas of the layer becoming tacky;

(b) toning the tacky image areas by applying and adhering thereto a toner material which is swollen or solubilized when in contact with the tacky image areas, and removing any excess toner;

(c) buffing or rubbing the toned image areas whereby the areas become glossy;

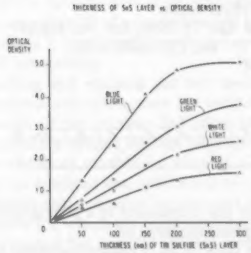
(d) repeating steps (a), (b) and (c) at least once using a different image-bearing transparency for each exposure (a) and toning with a toner of appropriate color difference from the color of the toner of step (b).

4,292,395

PHOTOGRAPHIC PROCESS OF DEVELOPING AND ETCHING AN ELEMENT CONTAINING A TIN SULFIDE

Minoru Wada; Fumiaki Shinozaki; Yohnosuke Takahashi; Satoshi Yoshida, all of Asaka, and Tomoaki Ikeda, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1980, Ser. No. 177,965
Claims priority, application Japan, Aug. 17, 1979, 54-104680
Int. Cl.[3] G03C *5/00*
U.S. Cl. 430—299 4 Claims



1. An image forming process which comprises:

(1) imagewise exposing a photosensitive image forming material comprising a tin sulfide image forming layer on a base and a photosensitive resin composition layer on said layer with actinic radiation; and

(2) developing said photosensitive resin composition layer by contact with an aqueous alkaline solution to simultaneously remove the tin sulfide image forming layer by etching in areas where said photosensitive resin composition layer has been removed.

4,292,396

METHOD FOR IMPROVING THE PRESS LIFE OF A LITHOGRAPHIC IMAGE HAVING AN OUTER LAYER COMPRISING AN EPOXY RESIN AND ARTICLE PRODUCED BY METHOD

Lester O. Eime, St. Louis County, and Edward H. Parker, Ballwin, both of Mo., assignors to Western Litho Plate & Supply Co., St. Louis, Mo.

Filed Mar. 3, 1980, Ser. No. 126,687
Int. Cl.³ G03F *7/00, 7/08*
U.S. Cl. 430—302 **11 Claims**

1. A method of increasing the strength, abrasion-resistance, solvent-resistance and press life of a lithographic image of a lithographic plate comprising said image over a substrate having a water-wettable hydrophilic surface, said image comprising a layer of light-reacted light sensitive material and an outer layer comprising an epoxy resin overlying said light-reacted layer, the method comprising the steps of:

contacting and wetting the surface of said outer layer with an aqueous solution comprising at least about 7% by weight of a boron trifluoride-amine complex;

evaporating solvent from said solution on said surface to deposit dry boron trifluoride-amine complex on said outer layer; and

heating said outer layer in the presence of said complex to cross-link said epoxy resin and form a hard, tough abrasion-resistant, solvent-resistant and wear-resistant epoxy resin layer at the outside of said image.

11. A planographic printing plate comprising a substrate having a water-wettable hydrophilic surface and over said hydrophilic surface a printing image defined by a coating comprising a layer comprising a light-reacted light sensitive layer and overlying said light-reacted layer an outer oleophilic ink-receptive layer comprising an epoxy resin cross-linked by heating in the presence of a topically applied boron trifluoride-amine complex, said outer layer imparting strength, abrasion resistance, solvent resistance and press wear resistance to said plate.

4,292,397

METHOD FOR PREPARING DRY PLANOGRAPHIC PLATES WITH PLASMA

Satoshi Takeuchi, Kawasaki; Masanori Akada, Tokyo; Hitoshi Fujii, Kasukabe; Takashi Toida, Chiba; Minoru Takamizawa, and Yoshio Inoue, both of Annaka, all of Japan, assignors to Dai Nippon Printing Co., Ltd. and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

Filed Apr. 17, 1980, Ser. No. 141,187
Int. Cl.³ G03F *7/02*
U.S. Cl. 430—303 **13 Claims**

1. A method for the preparation of a planographic printing plate which comprises the steps of:

(a) providing a layer of an organopolysiloxane on one surface of a base plate,

(b) providing a pattern-wise protective resist layer on the surface of the organopolysiloxane layer,

(c) subjecting at least the superficial layer of the organopolysiloxane in the areas where no protective resist layer is provided thereon to a chemical treatment with chemical species activated in a plasma state to render the superficial layer oleophilic and ink-receptive, and

(d) removing the protective resist layer.

4,292,398

METHOD FOR THE PREPARATION OF RELIEF STRUCTURES BY PHOTOTECHNIQUES

Roland Rubner, Röttenback; Eberhard Kühn, Hemhofen, and Hellmut Ahne, Röttenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,143
Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919840
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—306 **7 Claims**

1. In a method for the preparation of relief structures by phototechniques wherein a mixture of a photo-initiator and an unsaturated photo- or radiation-sensitive polymer containing ethylenically unsaturated acrylate and/or methacrylate groups is applied to a substrate in the form of a layer or foil; the layer or foil is exposed or irradiated through a mask; and the non-exposed or non-irradiated portions of the layer or foil are removed from the substrate to obtain a relief structure, the improvement comprising utilizing as said photo-initiator an aromatic azide free of maleinimide groups.

4,292,399

COBALT (III) COMPLEX IMAGING COMPOSITIONS HAVING IMPROVED PHOTOGRAPHIC PROPERTIES

Anthony Adin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 22, 1979, Ser. No. 87,191
Int. Cl.³ G03C *1/40, 1/48, 1/00, 1/10*
U.S. Cl. 430—338 **15 Claims**

1. A light-sensitive image-forming composition, comprising, in admixture:

(a) a reducing cobalt(III) complex;

(b) a reducing-agent precursor which forms, in the presence of reduction products of said complex, a reducing agent for said cobalt(III) complex; and

(c) an organic oxidizing agent capable of functioning as an antifoggant in said composition.

4,292,400

PHOTOGRAPHIC SILVER HALIDE DEVELOPMENT IN THE PRESENCE OF THIOETHER DEVELOPMENT ACTIVATORS

Robert J. Pollet, Vremde; Francis J. Sels, Kontich; Karel A. Brems, Begijnendijk, and Maurice A. de Ramaix, Hove, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Sep. 10, 1980, Ser. No. 185,931
Claims priority, application United Kingdom, Sep. 27, 1979, 33608/79
Int. Cl.³ G03C *5/30, 1/48, 7/00*
U.S. Cl. 430—383 **12 Claims**

1. Method of developing an image-wise exposed photographic silver halide element in the presence of an oxathioether development activator, wherein the oxathioether development activator corresponds to the following general formula:

$$R^1—A—(OCH_2CH_2)_n—S—A'—(X—A''-)_m—Y—R^2$$

wherein:

R^1 represents hydrogen, a C_1–C_4 alkyl group, a C_1–C_4 alkyl group substituted by one or more hydroxy groups, or the group $R^2—Y—(A''—X)_m—A'—S—$,

A, A', and A'' (same or different) each represent a C_1–C_5 alkylene group, with the proviso that A is a chemical monovalent bond when R^1 is hydrogen or alkyl or substituted alkyl,

X represents —OCO—, —SO_2—, —CONH—, or the group Y,

Y represents a ligand or complexing function of the type of —S— and —N(Q)—, Q being hydrogen or alkyl,

R^2 represents a C_1–C_4 alkyl group or a C_1–C_4 alkyl group substituted by one or more hydroxy groups, or when Y is —N(Q)—, R^2 may represent together with Q the atoms necessary to complete a nitrogen-containing saturated ring,

n is a positive whole number of at least 2, and

m is 0 or 1.

5. Method according to claim 1, wherein the photographic element is a colour element and the development is a colour development.

7. Method according to claim 5, wherein said photographic colour element is a multicolour element comprising a blue-sensitive emulsion layer with yellow-forming colour coupler, a green-sensitized emulsion layer with magenta-forming colour coupler, and a red-sensitized emulsion layer with a cyan-forming colour coupler.

4,292,401
BLEACHING COMPOSITION FOR PHOTOGRAPHIC PROCESSING

Isamu Itoh; Taiji Hashimura, and Takatoshi Ishikawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 10, 1980, Ser. No. 139,038

Claims priority, application Japan, Apr. 12, 1979, 54/44621

Int. Cl.³ G03C *5/32*

U.S. Cl. 430—393 **28 Claims**

1. A bleaching composition for use in processing silver halide color photographic light-sensitive material, comprising compounds [I], [II], and [III] as follows:

Compound [I]: at least one persulfate;

Compound [II]: a water-soluble halide; and

Compound [III]: at least one compound selected from the compounds represented by following general formula [III];

wherein X represents carbon atoms or carbon and nitrogen atoms forming an unsubstituted or substituted 5-membered ring containing two unsaturated bonds, including a 5-membered ring fused with a 5- or 6-membered carbocyclic or heterocyclic ring.

4,292,402
LIGHT-SENSITIVE SILVER HALIDE MATERIALS CONTAINING FLUORINE-CONTAINING SURFACTANTS

Robert J. Pollet, Vremde; Hendrik E. Kokelenberg, Merksem; Rafaël P. Samijn, Wilrijk; Francis J. Sels, Kontich; Frans J. Ville, Edegem, and Nikolaas C. de Jaeger, Mortsel, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Feb. 8, 1980, Ser. No. 120,111

Claims priority, application United Kingdom, Feb. 28, 1979, 07040/79

Int. Cl.³ G03C *1/76, 1/38*

U.S. Cl. 430—631 **7 Claims**

1. Light-sensitive silver halide material comprising a support and one or more hydrophilic colloid layers including at least one light-sensitive silver halide emulsion layer, wherein at least one hydrophilic colloid layer comprises at least one surface-active agent corresponding to the general formula:

$(Rf—X)_n—A—L—Z$

wherein

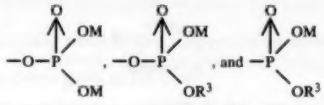
Rf represents a short-chain fluorine-containing group derived from hexafluoropropylene or trifluorochloroethylene, such short-chain group corresponding to one of the formulae Y—HCF—CF_2—, Y—CF=CF—, and F_2C=CF—CF_2— wherein Y represents chlorine or trifluoromethyl,

X represents oxygen, sulphur, or sulphonyl,

n represents an integer of at least 2, the Rf groups being same or different,

L represents a monovalent bond or a bivalent group selected from —COO—alkylene—, —$CONR^1$—alkylene—, and —SO_2NR^1—alkylene—, wherein R^1 is hydrogen or C_1–C_5 alkyl, and

Z represents a hydrophilic polyoxyethylene group or a hydrophilic group selected from the group consisting of —SO_3M, —OSO_3M, —COOM,



wherein M is hydrogen, an alkali metal, ammonium, or organic ammonium, and R^3 is alkyl, A represents a straight-chain or branched-chain aliphatic hydrocarbon group, an aromatic hydrocarbon group or a mixed aliphatic-aromatic hydrocarbon group which groups may be substituted or not; A being an aromatic hydrocarbon group when L is a monovalent bond and Z is a hydrophilic polyoxyethylene group.

4,292,403
DETECTION AND/OR DETERMINATION OF IGM, IGA, IGD AND IGE IMMUNOGLOBULINS

Willem Duermeyer, OSS, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Aug. 20, 1979, Ser. No. 67,680

Claims priority, application Netherlands, Aug. 24, 1978, 7808730

Int. Cl.³ G01N *33/54;* **C12Q** *1/70;* **G01N** *33/16;* **C12N** *9/96*

U.S. Cl. 435—5 **31 Claims**

1. Method for the detection or determination of an antigen specific immunoglobulin of a predetermined IgX class in a test medium wherein X is selected from the group consisting of M, A, D and E, comprising:

(a) contacting and reacting the test medium with either insolubilized anti-IgX against the antigen specific immunoglobulin of the peculiar IgX class to be detected or determined, or antigen binding fragment of said anti-IgX under conditions suitable for forming a reaction product of said insolubilized anti-IgX bound to said IgX;

(b) incubating said contacted and reacted test medium with an antigen for which the immunoglobulin to be detected or determined has specific affinity, and with a labelled antigen binding fragment of an antibody against said antigen; and

(c) detecting or determining the labelling fragment, which detection or determination provides qualitative or quantitative information about the antigen specific immunoglobulin to be detected or determined.

4,292,404

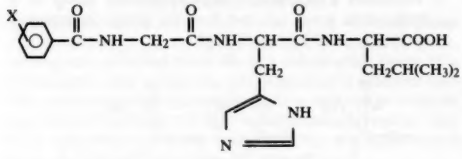
METHOD FOR DETERMINING THE ACTIVITY OF THE ANGIOTENSIN-CONVERTING ENZYME

Yasushi Kasahara, Tama, and Yoshihiro Ashihara, Fuchu, both of Japan, assignors to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1980, Ser. No. 186,075
Claims priority, application Japan, Sep. 26, 1979, 54-122562
Int. Cl.[3] C12Q *1/34, 1/28*
U.S. Cl. 435—18 **4 Claims**

1. A method for determining the activity of the angiotensin-converting enzyme comprising the steps of:

(1) mixing a liquid containing the angiotensin-converting enzyme with a reagent consisting essentially of X-hippuryl-L-histidyl-L-leucine having the formula



wherein X is OH, NH_2 or $N(CH_3)_2$, and with hippuricase, peroxidase, 4-aminoantipyrine and H_2O_2, under reaction conditions effective to form quinonimine dye, and

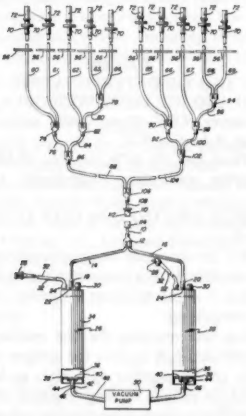
(2) colorimetrically measuring the concentration of said quinonimine dye produced in step (1).

4,292,405

STERILITY TEST SET

Carmine C. Mascoli, Deerfield; J. Lee Pope, Jr., Antioch, and Phillip L. Weber, Niles, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 885,747, Mar. 13, 1978. This application Feb. 19, 1980, Ser. No. 122,548
Int. Cl.[3] C12Q *1/22;* **C12M** *1/12*
U.S. Cl. 435—31 **3 Claims**



1. A method for testing sterility, which comprises the steps of:

connecting a conduit at its upstream end to a sample to be tested;

gravity-feeding the sample to be tested without vacuum through the conduit and to a test chamber connected to the downstream end of the conduit,

said test chamber including a main chamber portion and a filter located downstream of said main chamber portion, an inlet communicating with the main chamber portion for connection to the downstream end of the conduit, a separate test medium inlet communicating with the main chamber portion for enabling introduction of a test medium into the main chamber portion without requiring disconnection of the downstream end of the conduit from said inlet, and an air vent communicating with the main chamber portion for venting the main chamber portion during flow of the sample to be tested into the main chamber portion, whereby the sample to be tested may be fed into the main chamber portion by gravity flow;

drawing the sample to be tested through said filter within the main chamber portion using a vacuum pump;

injecting a test medium to the test chamber through said test medium inlet;

incubating the test chamber; and

observing the filter.

4,292,406

ANAEROBIC THERMOPHILIC CULTURE SYSTEM

Lars G. Ljungdahl, Athens, Ga., and Jürgen K. W. Wiegel, Göttingen, Fed. Rep. of Germany, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 11, 1979, Ser. No. 74,286
Int. Cl.[3] C12P *39/00*
U.S. Cl. 435—42 **6 Claims**

1. The mixed culture system comprising a biologically pure strain of the microorganism *Thermoanaerobacter ethanolicus,* having the identifying characteristics of ATCC 31550 and a biologically pure strain of the microorganism *Clostridium thermocellum,* having the identifying characteristics of ATCC 31549, said culture system having the ability to produce ethanol in recoverable quantities upon fermentation in an aqueous nutrient culture containing cellulose material.

4,292,407

ANAEROBIC THERMOPHILIC CULTURE

Lars G. Ljungdahl, Athens, Ga., and Jürgen K. W. Wiegel, Göttingen, Fed. Rep. of Germany, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 11, 1979, Ser. No. 74,287
Int. Cl.[3] C12P *7/06*
U.S. Cl. 435—161 **11 Claims**

1. A biologically pure culture of the microorganism *Thermoanaerobacter ethanolicus,* having the identifying characteristics of ATCC 31550, said culture having the ability to product ethanol upon fermentation in an aqueous nutrient medium containing a substrate selected from the group consisting essentially of the monosaccharides, disaccharides, pyruvate, pectin, and starch.

4,292,408

MASS AND A METHOD OF PREPARING SAME OF LIVING CELLS OF ORGANISMS FOR ADSORBING METAL IONS FROM A PHYSIOLOGICAL SOLUTION, AND EMPLOYMENT OF THE MASS FOR ENRICHING METALS

Ulrich Zimmermann, and Günter Pilwat, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 753,474, Dec. 22, 1976, abandoned. This application Mar. 12, 1979, Ser. No. 19,436
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558750
Int. Cl.[3] C12N *13/00, 1/20, 1/12;* **C02F** *3/00*
U.S. Cl. 435—173 **3 Claims**

1. A method specifically for removing metal ions contained in an aqueous solution, the method comprising the steps of:

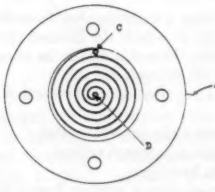
providing a treating solution which is physiologically compatible with living cells;
preparing a mass of single cell microorganisms, each having a cell wall with a membrane supported thereby, the mass weighing approximately 20% of the physiologically compatible solution;
suspending the mass of cells in the solution;
exposing the treating solution with the mass of cells suspended therein to an electric field having an intensity in the range of 1 to 20 KV/CM for a period of time sufficient to increase the porosity of the cell membranes wherein the increased porosity allows molecules within the cells and having diameters in the range of 2 to 50 Angström units to pass through the cell walls and into the treating solution;
limiting the exposure to a level which permits regeneration of the membranes after termination of the exposure;
removing the cells from the treating solution;
adsorbing the metal ions in the aqueous solution onto the cells by suspending the cells in the aqueous solution; and
removing the adsorbed metals from the aqueous solution by removing suspended cells therefrom, the aqueous solution having the desired metal ions include uranium ions, wherein the microorganisms are selected from the group consisting of chlorella algae, dunalliela algae, sea water, bacteria grown in nitrate and phosphate waste waters, wherein the exposure step comprises pulsing the treating solution four times at an intensity of about 10 KV/CM with a pulse duration of about 10 μsec, wherein the removing step comprises centrifuging the solution to separate the microorganisms from the solution and wherein the adsorbing step comprises suspending the microorganisms.

4,292,409

FLOW REACTOR FOR ENZYMATIC REACTIONS IN WHICH THE ENZYME IS IMMOBILIZED ON A SOLID MATRIX HAVING A PLANAR SURFACE

Pietro Cremonesi, Milan, Italy, assignor to Italfarmaco S.p.A., Milan, Italy

Filed Sep. 26, 1979, Ser. No. 79,036
Claims priority, application Italy, May 8, 1979, 22448 A/79
Int. Cl.³ C12M *1/40*
U.S. Cl. 435—288 **6 Claims**



1. A laminar flow reactor for reactions with an enzyme or a cofactor in which the enzyme or cofactor is immobilized on a matrix having planar surface, and the reaction solution is continuously introduced to react with said enzyme or said cofactor which consists of a cell comprising two semi-blocks having a planar surface, the first of said semi-blocks being provided with a spiral channel, said channel constituting the reaction chamber having a laminar flow, said two semi-blocks being hermetically fastened, the second semi-block closes said reaction chamber, said matrix adhering onto said second semi-block, and being compressed against said channel, and wherein one orifice is provided at the inlet of the spiral and one orifice is provided at the outlet of the spiral, said reaction solution being introduced through the inlet flowing through said channel with a laminar flow and being removed from the outlet after it has come in contact with said matrix.

4,292,410

PROCESS FOR THE PREPARATION OF HYDROCARBONS FROM SYNTHESIS GAS

Martin F. M. Post, and Lambert Schaper, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 16, 1979, Ser. No. 95,028
Claims priority, application Netherlands, Nov. 30, 1978, 7811735
Int. Cl.³ C07C *1/04*
U.S. Cl. 518—714 **8 Claims**

1. In a process for the preparation of a hydrocarbon mixture of pentanes and higher and containing aromatics, which process comprises contacting a mixture of carbon monoxide and hydrogen at an elevated temperature and pressure with a catalyst mixture consisting essentially of two catalysts, a catalyst X being capable of catalysing the conversion of an H_2/CO mixture into substantially methanol and/or dimethyl ether, and containing zinc together with chromium, and a catalyst Y, which is a crystalline silicate, which silicate is characterized by having the following properties after 1 hour's calcining in air at 500° C.:
(a) thermally stable up to a temperature above 600° C.,
(b) an X-ray powder diffraction pattern showing, inter alia, the reflections given in Table A:

TABLE A

Radiation: Cu-Ka 2 θ	Wavelength 0.15418 nm relative intensiyl
7.8–8.2	S
8.7–9.1	M
11.8–12.1	W
12.4–12.7	W
14.6–14.9	W
15.4–15.7	W
15.8–16.1	W
17.6–17.9	W
19.2–19.5	W
20.2–20.6	W
20.7–21.1	W
23.1–23.4	VS
23.8–24.1	VS
24.2–24.8	S
29.7–30.1	M

where the letters used have the following meanings: VS=very strong; S=strong; M=moderate, W=weak; θ=angle according to Bragg's law.
(c) after evacuation at 2×10^{-9} bar and 400° C. for 16 hours and measured at a hydrocarbon pressure of 8×10^{-2} and 100° C., and adsorption of n-hexane is at least 0.8 mmol/g, the adsorption of 2,2-dimethylbutane at least 0.5 mmol/g, and the ratio

$$\frac{\text{adsorption of n-hexane}}{\text{adsorption of 2,2-dimethylbutane}}$$

at least 1.5
(d) the composition, expressed in moles of the oxides, is as follows: $y.(1.0\pm0.3).M_2O.y.Al_2O_3.SiO_2$, where M=H and alkali metal, the improvement comprising $0.0020<y\leqq0.0040$.

4,292,411

PROCESS FOR PREPARING INTEGRAL SKIN POLYURETHANE AND POLYURETHANE SO OBTAINED

Lucien Jourquin, Wetteren, and Eddie Du Prez, St. Maria Dudenhove, both of Belgium, assignors to S.A. PRB, Brussels, Belgium

Filed Mar. 10, 1980, Ser. No. 128,768
Claims priority, application Luxembourg, Mar. 9, 1979, 81024
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—51 **30 Claims**

1. An improved process for preparing integral skin polyure-

thane foam, wherein a reaction mixture comprising polyol, polyisocyanate the NCO groups of which are not directly bonded to an aromatic group, no more than 0.5 part by weight of water to 100 parts by weight of polyol, and a catalyst is reacted in a mould, said improvement comprising using as the catalyst a synergistic combination of (a) at least one organic initiator containing at least one of a primary or secondary amino functional group, and (b) at least one organic compound of bismuth.

4,292,412

HYDROPHILIC, FABRIC SOFTENER FOAM COMPOSITIONS AND METHOD OF MAKING

Louis L. Wood, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Jan. 16, 1980, Ser. No. 112,575

Int. Cl.³ C08G *18/14, 18/10, 18/32, 18/38*

U.S. Cl. 521—107 **5 Claims**

1. A fabric softener-containing, urethane foam-forming composition comprising

(a) a water reactant;

(b) a prepolymer comprising at least one isocyanate-capped polyol having a reaction functionality of at least two, the total of said polyol present having an ethylene oxide content of at least 40 weight percent before capping;

(c) when the reaction functionality of (b) is two, a crosslinking agent containing at least three functional groups;

(d) a hydrophilic polyether polyol release agent

and (e) a fabric softener, the weight ratio of (a):(b) being 0.3 to 2.0:1.0.

4,292,413

PROCESS FOR THE PRODUCTION OF EPOXY CELLULAR SOLID PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 107,044, Dec. 26, 1979, Pat. No. 4,235,974, which is a continuation-in-part of Ser. No. 4,039, Jan. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 821,584, Aug. 4, 1977.

This application Jun. 25, 1980, Ser. No. 162,723

Int. Cl.³ C08J *9/02*

U.S. Cl. 521—136 **44 Claims**

1. The process for the production of epoxy cellular solid reaction products in a non aqueous medium without the addition of a blowing agent, by the following steps:

(a) adding about 1 to 3 parts by weight of an organic polyamine compound selected from the group consisting of alkylenepolyamine, polyalkylenepolyamine, arylenepolyamine, polyamide polymers containing 2 or more free amine groups per molecule and mixtures thereof,

(b) adding slowly 1 to 5 parts by weight of an epoxy compound while

(c) agitating the mixture and keeping the temperature between 20° C. to 70° C. until the resulting chemical reaction is complete, thereby

(d) producing an epoxy prepolymer,

(e) admixing 0 to 2 parts by weight of a foam regulator and 1 to 2 parts by weight of an isocyanate, selected from the group consisting of arylene polyisocyanates, alkylene polyisocyanates, and mixtures thereof, to the epoxy prepolymer

(f) heating the epoxy prepolymer to a temperature of 80° C. to 100° C. until the mixture expands, thereby

(g) producing an epoxy cellular reaction product.

4,292,414

PROCESS FOR THE PREPARATION OF MODIFIED BLOCK COPOLYMERS

Akira Saito, Fujisawa; Akio Yamori, and Toshio Ibaragi, both of Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1979, Ser. No. 89,237

Claims priority, application Japan, Aug. 16, 1978, 53/99102; Oct. 31, 1978, 53/133244

Int. Cl.³ C08L *53/02*

U.S. Cl. 525—255 **23 Claims**

1. A process for preparing a modified block copolymer by graft-reacting at least one maleic acid compound with an aromatic vinyl compound-conjugated diene compound block copolymer containing at least one polymer block mainly composed of a conjugated diene compound at least one polymer block mainly composed of an aromatic vinyl compound, the aromatic vinyl compound/conjugated diene compound weight ratio being within the range of from 5/95 to 97/3, characterized in that said graft reaction is carried out by melt-mixing said block copolymer and maleic acid compound in the presence of a radical inhibitor without using any radical initiator while adjusting reaction temperatures and times wherein the generation of radicals can be substantially inhibited to obtain a modified block copolymer grafted with a maleic acid compound having a toluene insolubles content of not more than 1% by weight, and a ratio of melt flow index of said modified block copolymer to that of the block copolymer before modification of 0.025–2.0.

4,292,415

NOVEL FISCHER-TROPSCH CATALYSTS

Kurt P. C. Vollhardt, Kensington, and Patrick Perkins, Berkeley, both of Calif., assignors to The United State of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 39,986, May 17, 1979, Pat. No. 4,230,633. This application Apr. 29, 1980, Ser. No. 145,187

Int. Cl.³ C08F *8/18, 8/22*

U.S. Cl. 525—357 **9 Claims**

1. A process of preparing a polystyrene supported cycloalkadienyl metal complex of the formula:

$$(PS)\text{—}RMe(CO)_nH_m$$

where:

(PS) represents a macroporous divinylbenzene crosslinked polystyrene in which the divinylbenzene crosslinking is greater than 1% and in which the pore size is in the range of about 100 through 900 A°.

R represents a cycloalkadienyl radical of 4 through 6 carbon atoms;

Me represents a Group VIII metal;

CO represents a carbonyl radical;

H represents hydrogen;

n represents an integer varying from 0 to 3, and

m is an integer varying from 0 to 2 inclusively with the further provision that 2n+m must total 18 when added to the electrons in R and Me, or n+m must total 0, which process comprises:

brominating (PS)—H by treating same with bromine in the presence of a thallium salt in a partially or fully halogenated hydrocarbon solvent to form (PS)—Br;

treating said (PS)—Br so produced with an alkyl lithium of about 1 through 12 carbon atoms in an aromatic hydrocarbon solvent of 6 through 8 carbon atoms to produce (PS)—Li;

substituting said PS—Li so produced by reaction with a 2-cycloalkenone of 4 to 6 carbon atoms in the presence of an ether solvent and using a water work-up to form a cycloalkenylalcohol-substituted (PS);

dehydrating said alcohol so produced by heating under a vacuum to produce a cycloalkadienyl-substituted (PS);

reacting said cycloalkadienyl-substituted (PS) with metal carbonyl in the presence of a partially or fully halogenated hydrocarbon, an aromatic hydrocarbon of 6 through 8 carbon atoms, ethers and esters of 4 through 10 carbon atoms as solvent to produce a polystyrene-supported cycloalkadienyl metal carbonyl.

4,292,416

POLYMER BLENDS

Robert S. Shue, and Lacey E. Scoggins, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Feb. 21, 1980, Ser. No. 122,980
Int. Cl.³ C08L *81/04, 77/00*
U.S. Cl. 525—420 **12 Claims**

1. A polymeric blend exhibiting improved properties comprising:

(a) a major amount of a polyamide selected from the group consisting of polyamide resins obtained by

(1) the polymerization of caprolactam, and

(2) the condensation of a dibasic acid and a diamine, and

(b) a small but effective minor amount ranging from about 0.01 to about 10 weight percent of the total composition, sufficient to improve impact strength and/or warpage resistance of the blend, of a poly(arylene sulfide) resin.

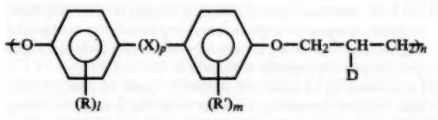
4,292,417

SEMIPERMEABLE MEMBRANE

Kiyoshi Ishii; Ryoshu Suzuki; Zenjiro Honda, and Hitoshi Tsugaya, all of Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 910,877, May 30, 1978, Pat. No. 4,200,726. This application Sep. 20, 1979, Ser. No. 77,202
Claims priority, application Japan, Jun. 1, 1977, 52-64427
Int. Cl.³ C08G *59/14*; C02F *1/44*
U.S. Cl. 525—510 **15 Claims**

1. A water-insoluble semipermeable membrane which has been prepared by immersing a semipermeable membrane consisting essentially of a membrane-forming polymer having the formula:



(I)

wherein

R and R′ are halogen, nitro, methyl or ethyl and R and R′ are the same or different, X is a divalent group selected from the group consisting of methylene, ethylene, isopropylidene, ether (—O—), carbonyl (—CO—), sulfide (—S—), sulfoxide (—SO—) and sulfone (—SO_2—), l and m are integers of from 0 to 4, p is 0 or 1, n is an integer of from 100 to 1000, wherein from 15 to 90% of said D groups are sulfuric acid groups or salts thereof with an alkali metal, ammonia or a nitrogen-containing basic organic compound, and the balance of said D groups are hydroxyl groups,

in an aqueous solution or an organic solvent solution of a cross-linking agent selected from the group consisting of melamine and urea resins, benzoguanamine resins, amino resins mixed with benzoguanamine resins, aldehydes, di-functional epoxides, tri-functional epoxides and alkaline earth metal divalent cations, under conditions effective to cross-link said polymer whereby to reduce the swelling of the membrane caused by an organic solvent, minimize the reduction of the membrane properties when the membrane is used continuously for a long time and to increase the mechanical strength of the membrane.

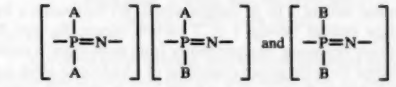
4,292,418

CURING FLUORINATED ALKOXY PHOSPHONITRILE POLYMER WITH PEROXIDE AND ALUMINUM COMPOUND

Jong Joung, South Pasadena, Calif., assignor to The Kendall Company, Walpole, Mass.

Filed Dec. 26, 1979, Ser. No. 107,140
Int. Cl.³ C08G *79/04*
U.S. Cl. 525—538 **6 Claims**

1. In a method of cross-linking a linear polymer containing randomly distributed repeating units having the structures:



wherein A represents $X(CF_2)m\ CH_2O$- and B represents $Y(CF_2)N\ CH_2O$-, X and Y each being selected from the group consisting of hydrogen and fluorine, and m and n each being an integer from 1 to 8 inclusive with an organic peroxide by contacting said polymer with said peroxide, the improvement comprising including along with the organic peroxide an alkyl aluminum compound having the composition

AL $R_1R_2R_3$

wherein R_1 is selected from the group consisting of hydrogen and alkyl having from 2 to 8 carbon atoms and R_2 and R_3 are alkyl having from 2 to 8 carbon atoms, the amount of said alkyl aluminum compound being from 0.1 to 2% by weight of said polymer.

4,292,419

PROCESS FOR PRODUCING RADIATION-SHIELDING PLASTIC MATERIALS

Kazumasa Kamada, and Kazuya Okada, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

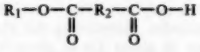
Filed Apr. 24, 1980, Ser. No. 143,516
Claims priority, application Japan, May 15, 1979, 54/59357; May 16, 1979, 54/59957
Int. Cl.³ C08F *2/44*; G21F *1/00*; C07F *7/24*
U.S. Cl. 526—192 **14 Claims**

1. A process for producing a radiation-shielding plastic material, which comprises polymerizing, in the presence of a radical polymerization initiator and a lead compound, a mixture of:

(A) 10 to 94% by weight of a vinyl monomer component consisting of at least one vinyl monomer selected from the group consisting of alkyl methacrylates, alkyl acrylates, hydroxyalkyl methacrylates and hydroxyalkyl acrylates, in each of which the alkyl radical has 1 to 4 carbon atoms, and styrene, and;

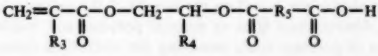
(B) 6 to 90% by weight of an organic acid component containing, as an indispensable ingredient, at least one carboxylic acid selected from the group consisting of:

(a) dibasic carboxylic acid monoesters of the formula (I):



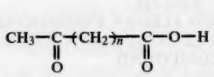
(I),

(b) unsaturated carboxylic acid of the formula (II):



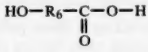
(II)

(c) oxocarboxylic acids of the formula (III):



and; (III)

(d) hydroxycarboxylic acids of the formula (IV):



(IV)

in which formulae (I) through (IV), R_1 represents a hydrocarbon radical having 1 to 10 carbon atoms; R_2 represents a hydrocarbon radical having 1 to 7 carbon atoms; R_3 and R_4 respectively represent, independently from each other, a member selected from the group consisting of a hydrogen atom and a methyl radical; R_5 represents a hydrocarbon radical having 2 to 7 carbon atoms; R_6 represents a hydrocarbon radical having 1 to 3 carbon atoms, and; n represents an integer of from 0 to 4.

4,292,420

EMULSION POLYMERIZATION PROCESS FOR PRODUCING VINYL DISPERSION RESINS

James W. Turner, Bay Village, and Bela K. Mikofalvy, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 20, 1979, Ser. No. 105,693
Int. Cl.³ C08F *14/06*
U.S. Cl. 526—212 **16 Claims**

1. A process for producing polymers of vinyl and vinylidene halides and copolymers thereof with each other or either with up to about 80% by weight of one or more other monoethylenically unsaturated monomers copolymerizable therewith comprising, forming a monomer premix containing the monomer or monomers to be polymerized, the aqueous reaction medium, from about 0.05% to about 0.5% by weight of a free radical yielding catalyst based on the weight of 100 parts of monomer(s) being polymerized, from about 0.5% to about 4.0% by weight, based on the weight of the monomer or monomers being polymerized, of at least one emulsifier for the polymerization system selected from the group consisting of fatty acid salts containing from 8 to 20 carbon atoms, and sulfate and sulfonate type soaps from C_{12} to C_{20} alkyl or aryl hydrocarbons, mixing said premix at a temperature below the reactivity of the catalyst or catalysts employed, passing said premix to a reaction zone, emulsion polymerizing said premix in said zone at a temperature in the range of about 30° C. to about 70° C. to form a polymer latex containing individual spheres of polymer particles, maintaining the pH in the reaction zone in the range of about 3.0 to about 12.0 until the reaction is complete, removing the polymer latex from said reaction zone, mixing with said polymer latex from about 0.05% to about 5.0% by weight of a partially fugitive gas producing electrolyte, based on the weight of the polymer in the latex, filtering said latex to recover polymer and friable aggregates of polymer while removing the electrolyte therefrom, and lightly crushing said dried friable aggregates to form individual spheres of polymer particles.

4,292,421

ANIONIC POLYMERIZATION INITIATORS BASED ON ALKALI METAL AMIDES IN COMBINATION WITH ALKALI METAL SALTS AND ANIONIC POLYMERIZATION PROCESS USING THESE INITIATORS

Sylvie L. Boileau, Paris; Paul J. Caubere, Nancy; Serge F. Raynal, Draveil; Serge L. Lecolier, Janville sur Juine, and Gilberte N. N'Debeka, Vandoeuvre, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jun. 6, 1979, Ser. No. 46,192
Claims priority, application France, Jul. 6, 1978, 78 20220
Int. Cl.³ C08F *4/08, 112/08, 112/34, 120/14*
U.S. Cl. 526—220 **5 Claims**

1. Process for the polymerisation of vinyl or diene monomers capable of polymerising anionically by opening of an ethylenic double bond, wherein the reaction is initiated, in the presence of an aprotic solvent, by means of an initiator which is the product of the reaction of an alkali metal amide which is a member selected from the group consisting of sodium amide, potassium amide and lithium amide and at least one alkali metal salt of which the cation is a member selected from the group consisting of potassium, lithium, and sodium, the anion being a member selected from the group consisting of the thiocyanate, cyanate, cyanide and nitrite anions, in a molar ratio of alkali metal amide/associated salt at least equal to 1 up to 12.

4,292,422

OXYGEN-CURABLE MERCAPTO-FUNCTIONAL ORGANOSILICON-ORGANIC COMPOUND COMPOSITIONS CATALYZED BY METAL CARBONYL COMPOUNDS AND METHOD OF FORMING HIGHER MOLECULAR WEIGHT PRODUCTS THEREFROM

Gary R. Homan, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 3, 1979, Ser. No. 99,254
Int. Cl.³ C08G *77/06*
U.S. Cl. 528—15 **28 Claims**

1. A composition of matter, stable in the absence of oxygen, which consists essentially of a product obtained by mixing the following substantially in the absence of oxygen

(A) 100 parts by weight of an ingredient selected from the group consisting of

(1) at least one mercapto-functional copolymer having both organic compound segments and organosilicon compound segments, there being an average of at least two mercapto groups per copolymer molecule and

(2) a mixture of at least two different types of components, said components being selected from the group consisting of (a) at least one copolymer as described in (A)(1) above, (b) at least one mercapto-functional organic compound which contains an average of at least two mercapto groups per molecule and (c) at least one mercapto-functional organosilicon compound selected from the group consisting of mercapto-functional organosilanes and mercapto-functional organosiloxanes,

wherein

each organic compound segment and mercapto-functional organic compound is free of silicon atoms, aliphatic unsaturation and radicals which are reactive with mercapto groups at room temperature;

said mercapto-functional organosilanes have an average of at least two mercapto groups per molecule and are of an average formula

$$\{(HS)_vZ\}_wSiR^8_{4-w}$$

where

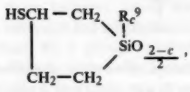
each Z is a divalent or polyvalent hydrocarbon radical free of aliphatic unsaturation, the valence of Z being $v+1$,

each R^8 is a monovalent hydrocarbon radical free of aliphatic unsaturation or OR^7,

each R^7 is an alkyl radical of 1 to 4 inclusive carbon atoms,

v has a value greater than 0,
w has a value of from 1 to 3 inclusive and the sum of v+w has a value of at least 3; and
said mercapto-functional organosiloxanes have an average of at least two mercapto-functional siloxane units per molecule selected from the group consisting of mercapto-functional siloxane units of the average unit formula

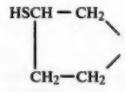
$$\{HSC_nH_{2n}\}aR^9_bSiO_{(4-a-b)/2}$$ and



any other siloxane units present having the average unit formula

$$R^{10}_dSiO_{(4-d)/2}$$

where
each R^{10} is a hydroxyl radical or an organic radical selected from the group consisting of R^9 and 3,3,3-trifluoropropyl radicals,
each R^9 is R^6 or OR^7,
each R^6 is an alkyl radical of 1 to 4 inclusive carbon atoms or phenyl radical,
n has a value of from 2 to 4 inclusive,
a has a value of from 1 to 2 inclusive,
b has a value of from 0 to 2 inclusive,
c has a value of from 0 to 1 inclusive,
d has a value of from 0 to 3 inclusive and the sum of a+b has a value of from 1 to 3 inclusive, and
the ratio of the total R^6, $HSC_nH_{2n}-$,



and 3,3,3-trifluoropropyl radicals to silicon atoms in the mercapto-functional organosiloxane is in the range of 0.98/1 to 3.00/1;
(B) 0 to 200 parts by weight of at least one filler; and
(C) a catalytic amount of a metal carbonyl compound selected from the group consisting of $Fe(CO)_5$, $Fe_2(CO)_9$, $Fe_3(CO)_{12}$, dicyclopentadienyldiiron tetracarbonyl, butadieneiron tricarbonyl, cyclohexadieneiron tricarbonyl, $Ni(CO)_4$, dicyclopentadienyldinickel dicarbonyl, $Mn_2(CO)_{10}$, methylcyclopentadienylmanganese tricarbonyl and cyclopentadienylcobalt dicarbonyl.

4,292,423

PROCESS FOR THE PREPARATION OF ORGANOPOLYSILOXANES

Rudolf Kaufmann; Johann Müller, and Karl-Heinrich Wegehaupt, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 27, 1980, Ser. No. 134,407
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915751; May 25, 1979, 2921375
Int. Cl.³ C08G 77/06
U.S. Cl. 528—18 **4 Claims**

1. A process for preparing organopolysiloxanes having substituted carbamoyl groups which are bonded to silicon through oxygen, which comprises reacting a diorganopolysiloxane having at least one Si-bonded hydroxyl group with an organic isocyanate having at least 2 isocyanate groups per molecule as the sole reactants in the presence of a catalytic amount of an organic tin compound supported on a solid material and thereafter separating the resultant reaction product from the catalyst under anhydrous conditions.

3. The process of claim 1, wherein activated carbon is used as the support for the tin compound.

4,292,424

PROCESS FOR RECOVERING VINYL POLYMERS FROM EMULSION POLYMERIZATION LATICES

George R. Huddleston, Jr., Lorain; James W. Turner, Bay Village, both of Ohio, and Kenneth D. Konter, Washburn, Ill., assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Mar. 3, 1980, Ser. No. 126,789
Int. Cl.³ C08F 6/14, 6/16
U.S. Cl. 528—500 **18 Claims**

1. A process for producing polymers of vinyl and vinylidene halides and copolymers thereof with each other or either with one or more polymerizable unsaturated olefinic monomers which comprises forming a monomer premix containing an aqueous reaction medium, the monomer or monomers to be polymerized, a free radical yielding catalyst, and at least one emulsifier, homogenizing said premix and passing the same to a reaction zone, polymerizing said premix in said zone at a temperature in the range of about 30° C. to about 70° C. and at a pH of about 3 to about 12 to produce a vinyl polymer latex, passing said latex through a stripping zone to remove unreacted monomer(s) therefrom with steam, passing said stripped latex to a coagulation zone, adding a coagulating agent to said latex in said coagulation zone at a pH in the range of about 2 to about 8 to form a slurry of friable agglomerates of polymer particles in a serum, passing said slurry to a pressure filter zone wherein the serum is removed under pressure through a permeable membrane and a wetcake of polymer is formed, rinsing said wetcake to remove residual compounds therefrom, pressing said wetcake to a solids content in the range of about 65% to about 75% by weight, passing said wetcake to a crumbling zone and breaking the same to form friable polymer agglomerates and particles, passing said polymer agglomerates and particles into a fluid energy mill while injecting heated air into said mill under a pressure in the range of about 2.5 psig. to about 80 psig. thereby grinding and drying said polymer agglomerates and particles, and recovering the polymer from said mill in the form of discrete particles thereof.

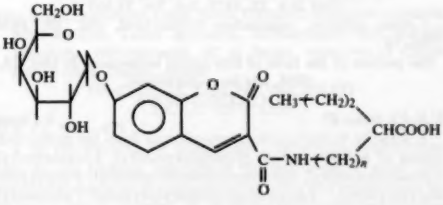
4,292,425

βGALACTOSYL-UMBELLIFERONE VALPROIC ACID CONJUGATES

Robert T. Buckler, Edwardsburg, Mich.; John F. Burd, and Raphael C. Wong, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 93,372, Nov. 13, 1979. This application Apr. 14, 1980, Ser. No. 139,716
Int. Cl.³ C07H 15/22, 17/04
U.S. Cl. 536—4 **2 Claims**

1. A β-galactosyl-umbelliferone-valproic acid conjugate of the formula:



wherein n is an integer from 3 through 8.

4,292,426
PROCESS OF PRODUCING HYDROXYPROPYL CELLULOSE

Seiji Orii, Nakagomura; Yukio Sasagawa, Arai; Akinori Ito, Joetsu; Maruyama, Hiromi, and Yoshiteru Sakai, both of Nakagomura, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed May 7, 1980, Ser. No. 147,639

Claims priority, application Japan, Jun. 15, 1979, 54/75440

Int. Cl.³ C08B *11/00*

U.S. Cl. 536—95 **4 Claims**

1. A process of producing hydroxypropyl cellulose which comprises

(a) swelling of cellulose with an aqueous sodium hydroxide solution containing 10–50 w% of NaOH.

(b) driving out excess aqueous caustic soda solution from the swollen cellulose to prepare a dehydrated cellulose,

(c) obtaining an alkali cellulose having the NaOH/cellulose ratio of 0.05–0.16 and the water/cellulose ratio of 0.2–0.5 by washing the dehydrated cellulose with an aqueous caustic soda solution containing less than 7 w% of caustic soda, and subsequent drying of the washed cellulose,

(d) reacting the alkali cellulose with propylene oxide in the presence of an inert diluent until M.S. of the reactant reaches to greater than 1.5 but less than 2,

(e) adding to the reaction mixture 0.2–0.7 parts of water per one part cellulose in the raw material alkali cellulose, and

(f) continuing further the etherification reaction until M.S. of the reactant reaches to greater than 2.5.

4,292,427
CEPHALOSPORIN COMPOUNDS

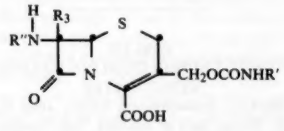
Stephen Marburg, Plainfield, and Janos Kollonitsch, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 742,486, Nov. 17, 1976, which is a continuation of Ser. No. 647,961, Jan. 9, 1976, abandoned, which is a continuation of Ser. No. 487,851, Jul. 11, 1974, abandoned, which is a continuation of Ser. No. 275,614, Jul. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,949, Aug. 25, 1971, abandoned. This application Dec. 13, 1979, Ser. No. 103,123

Int. Cl.³ C07D *501/20*

U.S. Cl. 544—021 **1 Claim**

1. A cephalosporin compound of the formula:



wherein R_3 methoxy, R′ is benzhydryl or trifluoroacetyl; and R″ is 2-thienylacetyl.

4,292,428
CEPHALOSPORIN DERIVATIVES

Marc Montavon, and Roland Reiner, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 25, 1979, Ser. No. 51,669

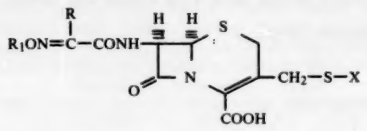
Claims priority, application Switzerland, Jul. 19, 1978, 7786/78

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.³ C07D *501/56*

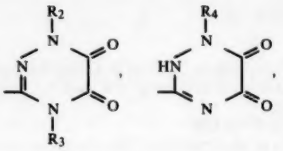
U.S. Cl. 544—27 **9 Claims**

1. Readily hydrolysable esters selected from the group consisting of acetoxymethyl, pivaloyloxymethyl, 1-acetoxyethyl, 1-pivaloyloxyethyl, methoxycarbonyloxymethyl, 1-ethoxycarbonyloxyethyl, 1-isopropoxycarbonyloxyethyl, phthalidyl, thiophthalidyl, methoxymethyl, acetamidomethyl, benzyl and cyanomethyl esters and readily hydrolysable ethers selected from the group consisting of the acetoxymethyl, pivaloyloxymethyl, 1-acetoxyethyl, 1-pivaloyloxyethyl, methoxycarbonylmethyl, 1-ethoxycarbonyloxyethyl, 1-isopropoxycarbonyloxyethyl, phthalidyl, thiophthalidyl, methoxymethyl and acetamidomethyl ethers of compounds of the formula

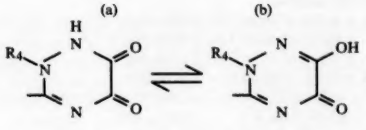


(I)

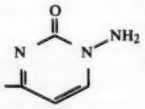
wherein R represents furyl, thienyl, phenyl or phenyl monosubstituted by halo, hydroxy, lower alkoxy or lower alkyl, R_1 represents lower alkyl or aminocarbonylmethyl and X represents a group of the formula



(a) (b)



(c₁) (c₂)



(d)

in which one of the two symbols R_2 and R_3 represents hydrogen and the other represents lower alkyl and R_4 represents lower alkyl,

and salts with pharmaceutically acceptable bases or acids of said esters and ethers and hydrates of said esters, ethers and salts.

4,292,429
IMIDAZOLE UREA AND AMIDO COMPOUNDS

Adrian Marxer, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

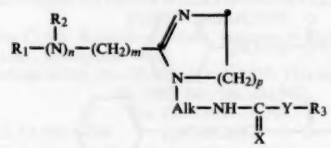
Filed Feb. 23, 1979, Ser. No. 14,661

Claims priority, application Switzerland, Mar. 8, 1978, 2519/78

Int. Cl.³ C07D *401/04, 401/06, 401/12*

U.S. Cl. 546—278 **6 Claims**

1. A urea or amido compound of the formula



(I)

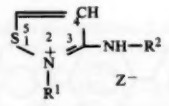
in which R_1 is pyridyl or pyridyl substituted by a group selected from halogen, lower alkyl, lower alkoxy, alkoxycarbonyl, carboxyl and trifluoromethyl and R_3 is phenyl or phenyl substituted by a group selected from halogen, lower alkyl, lower alkoxy, power alkoxycarbonyl, carboxyl and trifluoromethyl, R_2 is hydrogen or lower alkyl, n is 0 or 1, m is 0 or 1, p is 1, Alk is a lower alkylene radical with 2–3 carbon atoms in the linear chain, X is oxygen or sulphur and Y an imino group or a direct bond, and therapeutically acceptable salts thereof.

4,292,430
2,3-SUBSTITUTED-1,2-ISOTHIAZOLIUM SALT ANTIMICROBIALS

Joshua Rokach, Chomedey-Laval, Canada; Clarence S. Rooney, Worcester, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 23, 1977, Ser. No. 854,292
Int. Cl.³ C07D *275/02*
U.S. Cl. 548—206 **3 Claims**

1. A compound of the formula:



I

wherein

R^1 and R^2 are the same and are, C_1 to C_{16} alkyl, benzyl, or phenyl;

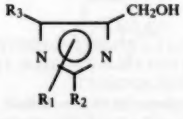
and Z^- is a counter anion.

4,292,431
PROCESS FOR THE PRODUCTION OF HYDROXYMETHYLIMIDAZOLES

Choong S. Kim; Kee J. Lee; Hong S. Kim, and Yung B. Chae, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

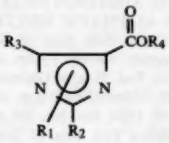
Filed Jun. 5, 1980, Ser. No. 156,806
Claims priority, application Rep. of Korea, Mar. 31, 1980, 80-1346
Int. Cl.³ C07D *233/64*
U.S. Cl. 548—342 **24 Claims**

1. A process for the production of an hydroxymethylimidazole of formula I or an organic or inorganic acid addition salt thereof



(I)

wherein R_1 represents hydrogen, a loweralkyl, cycloalkyl, aryl or aralkyl which is located on any one of the two nitrogen atoms in the imidazole nucleus; and R_2 and R_3 each independently represents hydrogen, a loweralkyl, cycloalkyl, aryl or aralkyl, which comprises reacting a compound of formula II



(II)

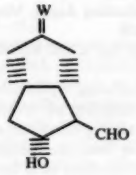
wherein R_1, R_2 and R_3 are as defined above and R_4 is hydrogen or a C_1–C_6 alkyl, with a source of formaldehyde in the presence of an alkali in an aqueous medium and optionally treating the resultant compound of Formula I with an organic or inorganic acid.

4,292,432
NOVEL ALDOL DERIVATIVES AND PRODUCTION THEREOF

Keiichi Ono, Osaka; Akihiko Sugie, Toyonaka; Hajime Kawakami, Takarazuka, and Junki Katsube, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 4, 1980, Ser. No. 117,981
Claims priority, application Japan, Feb. 9, 1979, 54/14690
Int. Cl.³ C07D *317/12, 319/08, 339/06*
U.S. Cl. 549—35 **4 Claims**

1. A process for producing a compound of the formula:



wherein C=W is a carbonyl group or a protected carbonyl group which comprises reacting a compound of the formula:

wherein C=W is as defined above in the presence of an acid or a base at a temperature ranging from −70° C. to room temperature.

4,292,433
METHOD FOR PRODUCING 3-CHLOROPROPYLTRICHLOROSILANE

Isao Koga, Sakurashi; Yohji Terui, Chibashi; Masuhito Ohgushi, Minamatashi; Tohru Kitahara, Minamatashi, and Kenichi Watanabe, Minamatashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Oct. 31, 1980, Ser. No. 202,621
Int. Cl.³ C07F *7/08*
U.S. Cl. 556—479 **2 Claims**

1. In the method for producing 3-chloropropyltrichlorosilane by the addition reaction of trichlorosilane to allyl chloride, the improvement comprising reacting said reactants in the presence of a complex of dichloro-bis(triphenylphosphine) platinum (II), $[Pt(PPh_3)_2Cl_2]$.

4,292,434

PROCESS FOR THE ADDITION OF SI-BONDED HYDROGEN TO AN ALIPHATIC MULTIPLE BOND

Tassilo Lindner, Mehring-Öd, Fed. Rep. of Germany; Georg Engelsberger, Ach, Austria; Norbert Zeller, and Rudolf Riedle, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,140

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1980, 3000768

Int. Cl.³ C07F *7/08*

U.S. Cl. 556—479 6 Claims

1. An improved process for the addition of Si-bonded hydrogen to an aliphatic multiple bond in the presence of a platinum catalyst, the improvement which comprises carrying out said addition reaction in the presence of a catalyst solution obtained from the reaction of a platinum halide with at least 20 parts by weight of olefin for each part by weight of platinum halide, and thereafter heating the resultant solution with from 0.5 to 1 mole of an amine selected from the group consisting of a primary and secondary amine for each gram atom of platinum.

4,292,435

METHOD OF PRODUCING BIPHENYLTETRACARBOXYLIC ESTERS

Hiroshi Itatani, Chiba; Akinori Shiotani, Ichihara, and Akiyoshi Yokota, Ishikawa, all of Japan, assignors to Ube Industries, Ltd., Chiba, Japan

Filed May 21, 1980, Ser. No. 151,818

Claims priority, application Japan, May 21, 1979, 54-61531; Sep. 27, 1979, 54-123169

Int. Cl.³ C07C *67/343*

U.S. Cl. 560—96 15 Claims

1. A method for producing biphenyltetracarboxylic esters, comprising oxidative coupling an orthophthalic diester in a molecular oxygen-containing atmosphere in the presence of a catalyst consisting of at least one member selected from the group consisting of (a) mixtures of at least one palladium salt with 1,10-phenanthroline in a molar amount of 0.9 to 4 times that of said palladium salt and (b) chelating reaction products of at least one palladium salt with 1,10-phenanthroline and.

4,292,436

PROCESS FOR THE PREPARATION OF N-PROTECTED N-FORMIMIDOYL 2-AMINOETHANETHIOL

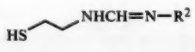
Thomas M. H. Liu, Westfield; Robert A. Reamer, Bloomfield; Ichiro Shinkai, Westfield, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 25, 1980, Ser. No. 162,990

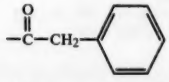
Int. Cl.³ C07C *149/20, 125/06;* C07F *7/10*

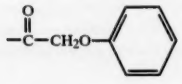
U.S. Cl. 560—148 8 Claims

1. A compound of the formula:

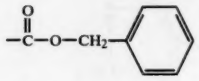


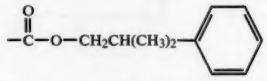
wherein R^2 is hydrogen or a protecting group is selected from the group consisting of: triorganosilyl,

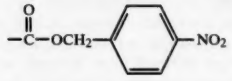




-continued







4,292,437

PREPARATION OF ISOBUTYRIC ACID AND ESTERS

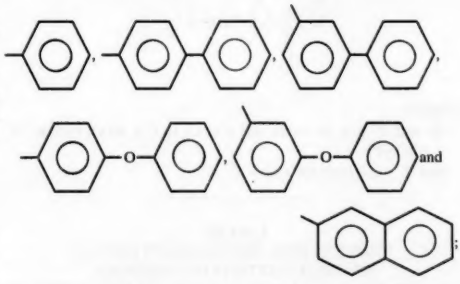
Edward N. Squire, Glen Mills, Pa., and Francis J. Waller, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 27, 1979, Ser. No. 53,232

Int. Cl.³ C07C *67/38*

U.S. Cl. 560—233 5 Claims

1. In the process for the carbonylation of propylene by contacting the propylene and carbon monoxide with water or a lower alkanol of 1 to 4 carbon atoms in the presence of solvent and a palladium catalyst in complex with a ligand, the improvement which comprises using as said ligand an ortho-substituted ligand of the formula P Ar_3 wherein each Ar is independently selected from



and wherein the Ar moieties bear a total of one or two substituents in positions ortho to one or two carbon-phosphorus bonds, the substituents being selected from the group consisting of lower alkyl of 1–4 carbon atoms, lower alkoxy and phenyl, and wherein the Ar groups each contain up to three substituents in positions meta or para to a carbon-phosphorus bond and selected from the group consisting of lower alkyl, lower alkoxy, chloride, fluoride, hydroxyl and carboxyl and provided that when Ar is

one or two of the Ar moieties can each bear one substituent selected from phenoxy and a fused aromatic hydrocarbon ring at an ortho position to form 1-naphthyl, and provided further that when the substituent is a fused aromatic hydrocarbon ring, each such Ar moiety can bear one additional substituent at a second ortho position selected from alkyl of 1–4 carbon atoms, alkoxy and phenyl.

4,292,438

13,14-DIDEHYDRO-9-DEOXY-9-METHYLENE-19-OXO-PGF$_2$ COMPOUNDS

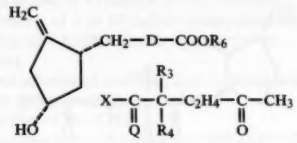
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,962

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,

(3) cis—CH_2—CH=CH—CH_2—CH_2—, or

(4) trans—$(CH_2)_3$—CH=CH—;

wherein g is zero, one, two, or three;

wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,

(g) —(p—Ph)—CO—CH_3,

(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,

(i) —(p—Ph)—NH—CO—(p—Ph),

(j) —(p—Ph)—NH—CO—CH_3,

(k) —(p—Ph)—NH—CO—NH_2,

(l) —(p—Ph)—CH=N—NH—CO—NH_2,

(m) β-naphthyl,

(n) —CH_2—CO—R_{28},

wherein (p—Ph) is para-phenyl or inter-para-phenylene,

wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

wherein X is —C≡C—.

4,292,439

13,14-DIHYDRO-INTER-OXA-11-DEOXY-11-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS

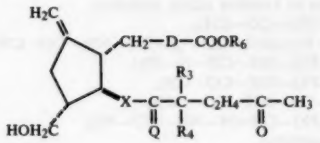
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,003

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) $(CH_2)_3$—O—CH_2—,

(2) $(CH_2)_2$—O—$(CH_2)CH_2$—, or

(3) —CH_2—O—$(CH_2)_3$—,

wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,

(g) —(p—Ph)—CO—CH_3,

(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,

(i) —(p—Ph)—NH—CO—(p—Ph),

(j) —(p—Ph)—NH—CO—CH_3,

(k) —(p—Ph)—NH—CO—NH_2,

(l) —(p—Ph)—CH=N—NH—CO—NH_2,

(m) β-naphthyl,

(n) —CH_2—CO—R_{28},

wherein (p-Ph) is para-phenyl or inter-para-phenylene,

wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

wherein X is —CH_2CH_2—.

4,292,440

13,14-DIDEHYDRO-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS

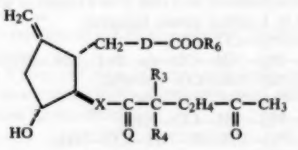
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,971

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or

(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—; wherein g is zero, one, two, or three; wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl; wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g)-(p—Ph)—CO—CH_3,
(h)-(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i)-(p—Ph)—NH—CO—(p—Ph),
(j)-(p—Ph)—NH—CO—CH_3,
(k)-(p—Ph)—NH—CO—NH_2,
(l)-(p—Ph)—CH=N—NH—CO—Nh_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and wherein X is —C≡C—.

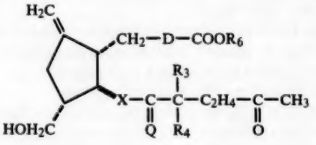
4,292,441

13,14-DIDEHYDRO-11-DEOXY-11-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-19-OXO-PGF$_2$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,977
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—CH_2—CH_2—, or
(4) trans-$(CH_2)_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β—naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenlyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

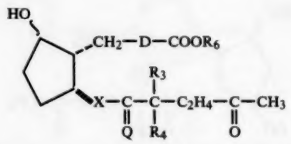
4,292,442

13,14-DIDEHYDRO-11-DEOXY-19-OXO-PGF$_2$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,976
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—CH_2—CH_2—, or
(4) trans-$(CH_2)_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(P—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

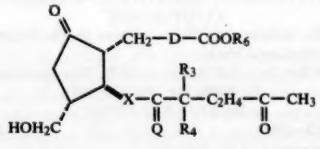
4,292,443

13,14-DIDEHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGE$_2$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,978
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—$CH_2(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—CH_2—CH_2—, or
(4) trans—$(CH_2)_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CH_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) —(p-Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

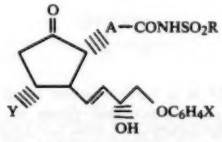
4,292,444

SULFONYL PROSTAGLANDIN CARBOXAMIDE DERIVATIVES

James F. Eggler, Stonington, and Thomas K. Schaaf, Old Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Feb. 8, 1980, Ser. No. 119,732
Int. Cl.³ C07C *143/74, 177/00*
U.S. Cl. 564—97 **6 Claims**

1. A sulfonyl prostaglandin carboxamide derivative of the formula



or the pharmacologically acceptable salt thereof, wherein:
R is alkyl of 1 to 4 carbons;
A is cis $(CH_2)_2HC$=$CH(CH_2)_2$ or trans $(CH_2)_4HC$=CH;
Y is H or OH; and
X is H, F, Cl, Br, OCH_3, CF_3 or CH_3.

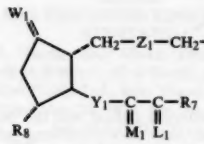
4,292,445

AMIDE AND SULFONAMIDE DERIVATIVES OF 2-DECARBOXY-2-AMINOMETHYL-PG-TYPE COMPOUNDS

Norman A. Nelson, Charleston Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 28, 1980, Ser. No. 144,709
Int. Cl.³ C07C *103/00, 143/72;* **A61K** *31/16, 31/18*
U.S. Cl. 564—98 **28 Claims**

1. A prostaglandin analog of the formula I



(a) wherein R_8 is hydrogen or hydroxy,
(b) wherein L_1 is β-R_3:α-R_4, α-R_3:β-R_4 or a mixture of both,
(c) wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
(d) wherein X_1 is —CO—R_1 or SO_2—R_1, wherein R_1 is alkyl of from 1 to 4 carbon atoms, —CH_2F, —CHF_2, —CF_3, phenyl, or monosubstituted phenyl, said substituted phenyl substituted by fluorine, chlorine, bromine, —CF_3, or —OCH_3 in the ortho, meta or para position,
(e) wherein M_1 is α-R_5:β-OH or β-R_5:α-OH; wherein R_5 is hydrogen or methyl;
(f) wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, or methylene;
(g) wherein R_7 is
(1) —$(CH_2)_m$—CH_3,
(2) -cis—CH=CH—CH_2CH_3,
(3) phenyl or alkylphenyl, wherein the alkyl portion of the moiety is from one to 3 carbon atoms, and the phenyl portion is optionally substituted by one to 3 of the following: chloro, fluoro, trifluoromethyl, alkyl of from one to 3 carbon atoms, with the proviso that no more than 2 groups are other than alkyl; or
(4) phenoxy optionally substituted by one, 2 or 3 of the following: chloro, fluoro, trifluoromethyl, alkyl of from one to 3 carbon atoms, or alkoxy of from one to 3 carbon atoms; with the proviso that no more than 2 groups are other than alkyl;
wherein m is one to 5, inclusive,
(h) wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —CH_2CH_2—, or
(4) —C≡C—; and
(i) wherein Z_1 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—(CH_2)—CH_2—,
(7) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—,
(8) —$(CH_2)_3$—O—$(CH_2)_{107}$ —,
(9) —(m-Ph)—CH_2—(CH_2)—, wherein (m-Ph) is 1,3-phenylene, or
(10) —(m-Ph)—O—$(CH_2)_g$— wherein (m-Ph) is 1,3-phenylene,
wherein g is zero, one, two, or three and 1 is one, two or three; and the pharmacologically acceptable acid addition salts thereof when X_1 is —SO_2R_1.

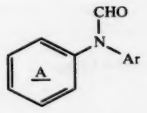
4,292,446

ANILINE DERIVATIVES

Norman Riley, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 935,498, Aug. 18, 1978, abandoned. This application Jul. 14, 1980, Ser. No. 168,513
Claims priority, application United Kingdom, Jan. 18, 1978, 1991/78
Int. Cl.³ C07C *102/00, 85/153*
U.S. Cl. 564—221 **8 Claims**

1. A formanilido compound of the formula:



wherein Ar is an aromatic radical and the benzene ring A contains at least two electron-withdrawing substituents and may be further substituted by methyl or methoxy.

4,292,447

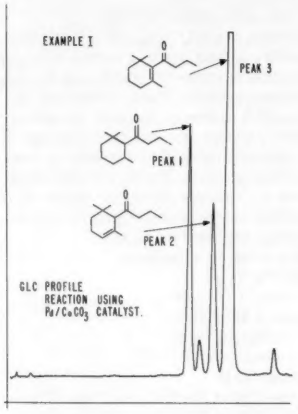
PROCESS FOR HYDROGENATION OF 2,6,6-TRIMETHYL CYCLOHEXENE DERIVATIVES, PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC USES OF SAID PRODUCTS

Robert W. Trenkle, Bricktown; Braja D. Mookherjee; Frederick L. Schmitt, both of Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

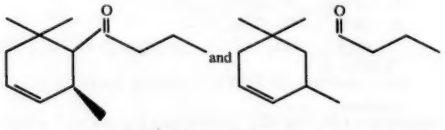
Filed Dec. 15, 1978, Ser. No. 969,852

Int. Cl.[3] **C07C** *49/303, 49/543;* **C11B** *9/00*

U.S. Cl. 568—378 **4 Claims**



1. The compound having the structure selected from the group consisting of:



4,292,448

PROCESS FOR THE HYDROFORMYLATION OF OLEFINS

Yoshitoshi Tsunoda; Shimpei Tomita, and Chihiro Miyazawa, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Apr. 22, 1980, Ser. No. 142,686

Claims priority, application Japan, May 11, 1979, 54-57862; Jan. 18, 1980, 55-4332

Int. Cl.[3] **C07C** *45/50*

U.S. Cl. 568—456 **15 Claims**

1. In a process for the hydroformylation of an olefin comprising reacting the olefin with carbon monoxide and hydrogen in a catalyst liquid containing a Group VIII noble metal-triarylphosphine complex as a catalyst, excess triarylphosphine and an organic solvent in a reaction zone to thereby form an aldehyde, and separating the aldehyde by evaporation from said reaction zone or by distillation in a separating step, the improvement which comprises:

removing a part of said catalyst liquid from said reaction zone or said separating step as a spent catalyst liquid containing a Group VIII nobel metal-triarylphosphine complex, free triarylphosphine, triarylphosphine oxide, and, high-boiling organic byproducts;

cooling said spent catalyst liquid to selectively crystallize said free triarylphosphine;

separating the crystals of said triarylphosphine from said spent catalyst liquid; and,

recycling said separated triarylphosphine to the reaction zone.

4,292,449

POLYFLUOROALLYLOXY COMPOUNDS, THEIR PREPARATION AND COPOLYMERS THEREFROM

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 20,354, Mar. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 850,729, Nov. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 747,029, Dec. 2, 1976, abandoned. This application May 1, 1980, Ser. No. 145,759

Int. Cl.[3] **C07C** *43/205, 43/15*

U.S. Cl. 568—649 **12 Claims**

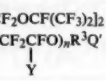
1. A polyfluoroallyloxy compound of the formula:

wherein X is —Cl or —F, and

R_F is:

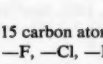
(i)

wherein R^1 is a carbon-carbon bond or a linear or branched perfluoroalkylene group of 1 to 12 carbon atoms; Q is $—OCF_2CF=CF_2$ or $—OC_6F_5$; Y and Y', independently, are —F or $—CF_3$ and only one of Y and Y' can be $—CF_3$; or



(ii)
(iii)

wherein R^3 is a linear or branched perfluoroalkylene group of carbon content such that the moiety



does not exceed 15 carbon atoms; Y is —F or $—CF_3$; n is 1 to 4; and Q' is —F, —Cl, —Br, —I, $—OCF_2CF=CF_2$, or $—OC_6F_5$.

4,292,450

SELECTIVE ALKYLATION OF 2,5-XYLENOL IN THE PRESENCE OF 2,4-XYLENOL

John R. Dodd, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Division of Ser. No. 97,248, Nov. 26, 1979, Pat. No. 4,249,026. This application Jun. 12, 1980, Ser. No. 158,972
Int. Cl.³ C07C *37/11*
U.S. Cl. 568—788 1 Claim

1. A method for selectively alkylating a 2,4-/2,5-xylenol mixture to yield predominantly 4-t-alkyl-2,5-xylenol with a lesser amount of 6-t-alkyl-2,4-xylenol comprising

(a) contacting a 2,4-/2,5-xylenol mixture together with an alkylating agent selected from the group consisting of olefins yielding a tertiary alkyl group in the presence of a strongly acidic sulfonated divinylbenzene-styrene copolymer at a temperature of 55° C. or less, then

(b) fractionating the resulting mixture to remove all unreacted xylenol.

4,292,451

HIGH MANNITOL PROCESS (ALKALINE HYDROGENATION IN PRESENCE OF ALKALI METAL CARBONATE)

Albert J. deBerardinis, and Walter M. Kruse, both of New Castle County, Del., assignors to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 891,712, Mar. 30, 1978, abandoned. This application Jul. 13, 1979, Ser. No. 57,397
Int. Cl.³ C07C *31/26;* C12P *19/24*
U.S. Cl. 568—863 12 Claims

1. A process for preparing a mannitol-rich solution of sorbitol and mannitol which comprises hydrogenating an aqueous epimerizate solution comprising glucose and mannose with hydrogen in the presence of a hydrogenation catalyst at a temperture from about 60° to about 100° C., said epimerizate solution containing an alkali metal salt of a weak acid in sufficient quantity to impart an initial pH from about 8 to about 10, so that the percentage of mannitol in said mannitol-rich solution exceeds the percentage of mannitol which would be obtained from hydrogenation of said epimerizate solution under non-isomerizing conditions.

4,292,452

RHODIUM-CATALYZED HYDROGENATION OF UNSATURATED ALDEHYDES TO UNSATURATED ALCOHOLS

Richard J. Lee, Downers Grove; Delbert H. Meyer, Naperville, and Darrell M. Senneke, Aurora, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 1, 1978, Ser. No. 874,132
Int. Cl.³ C07C *29/14, 33/03*
U.S. Cl. 568—881 9 Claims

1. A process for the selective hydrogenation of acrolein to allyl alcohol which comprises reacting acrolein with gaseous hydrogen at a temperature in the range 0° C.-250° C. in the presence of a rhodium-complex catalyst consisting essentially of:

(a) a rhodium atom;

(b) an organic polymer support having at least one functional atom selected from the group consisting of nitrogen and sulfur which is anchored onto the rhodium atom; and

(c) a plurality of activating ligands coordinated with the rhodium atom.

4,292,453

PROCESS FOR PREPARING RING HALOGENATED STYRENES

Stephen L. J. Daren, Beer Sheva; David Vofsi, and Meir Asscher, both of Rehovot, all of Israel, assignors to Makhteshim Chemical Works Ltd., Beer Sheva, Israel

Filed May 24, 1979, Ser. No. 42,159
Int. Cl.³ C07C *25/14*
U.S. Cl. 570—193 13 Claims

1. A process for preparing ring halogenated styrene monomers which comprises:

(a) reacting heterogenously ring halogenated beta-bromoethyl benzene with a strong aqueous alkali base in the presence of a quarternary phase transfer catalyst including a catalytic quantity of an inorganic nitrite salt reaction accelerator until substantially all the bromoethyl benzene has been converted to ring halogenated styrene monomer;

(b) separating the different phases,

(c) washing and neutralizing the organic phase, and

(d) recovering said ring halogenated styrene monomer.

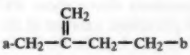
4,292,454

COUPLING REACTION INVOLVING A GRIGNARD AND ALLYLIC HALIDE

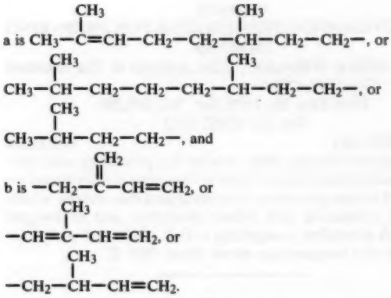
Carlos G. Cardenas, and Zia Ud Din, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 865,668, Dec. 29, 1977, Pat. No. 4,228,313, which is a division of Ser. No. 786,973, Apr. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 596,273, Jul. 16, 1975, abandoned, Ser. No. 596,426, Jul. 16, 1975, abandoned, Ser. No. 596,274, Jul. 16, 1975, abandoned, and Ser. No. 596,361, Jul. 16, 1975, abandoned. This application Mar. 18, 1980, Ser. No. 131,534
Int. Cl.³ C07C *11/21*
U.S. Cl. 585—16 6 Claims

1. A compound



wherein



a is $CH_3-C(CH_3)=CH-CH_2-CH_2-CH(CH_3)-CH_2-CH_2-$, or $CH_3-CH(CH_3)-CH_2-CH_2-CH_2-CH(CH_3)-CH_2-CH_2-$, or $CH_3-CH(CH_3)-CH_2-CH_2-$, and

b is $-CH_2-C(CH_2)-CH=CH_2$, or $-CH=C(CH_3)-CH=CH_2$, or $-CH_2-CH(CH_3)-CH=CH_2$.

4,292,455

MULTI-STAGE DEHYDROGENATION PROCESS FOR PREPARING INDENE

Joseph P. Bartek, University Heights; Rimoydas L. Cepulis, Euclid, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 108,328
Int. Cl.³ C07C *5/42, 5/367, 4/12, 5/48*
U.S. Cl. 585—320 16 Claims

1. A multi-stage catalytic dehydrogenation process for pre-

paring indene and substituted indenes from indene precursors more saturated than indene comprising

(a) contacting said indene precursor in a first dehydrogenation zone with a dehydrogenation catalyst at an elevated temperature to form an intermediate product,

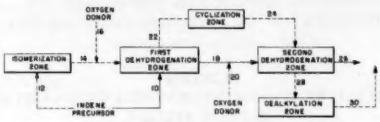
(b) advancing the product of the first dehydrogenation zone to a second dehydrogenation zone,

(c) contacting said product in the second dehydrogenation zone with a second dehydrogenation catalyst at an elevated temperature, and

(d) recovering indene or a substituted indene from said second zone.

15. A multi-stage catalytic oxydehydrogenation process for preparing indene comprising

(a) contacting a mixture of tetrahydroindene and a minor amount of vinyl norbornene in a first dehydrogenation zone at a temperature above about 100° C. with an oxygen source and a phosphate catalyst having the formula



$M_aP_xO_y$

wherein M is Mg, Cr, Fe, U, Ni, Bi, or sb and

$0.1\times \leqq \Sigma a \leqq 10\times$

wherein Σ a represents the sum of the subscripts a of all the metal ions and y is a number such that the valence requirements of the metal ions for oxygen are satisfied,

(b) advancing the product of the first zone to a second dehydrogenation zone,

(c) contacting said product in the second dehydrogenation zone at a temperature above about 100° C. with oxygen and a different phosphate catalyst of the formula $M_aP_xO_y$ wherein M is Mg, Co, La, Th, Bi, Sb, Pb, Ce or other rare earths and Σ a, x and y are as defined in (a) above, and

(d) recovering indene from said second zone.

4,292,456

OXYDEHYDROGENATION PROCESS FOR PREPARING INDENES

Oliver A. Kiikka, Willoughby, Ohio, assignor to The Standard Oil Co., Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 108,259
Int. Cl.³ C07C *5/32*
U.S. Cl. 585—431 **11 Claims**

1. An oxydehydrogenation process for producing unsubstituted or substituted indenes from at least one unsubstituted or substituted indene precursor more saturated than indene which comprises contacting said indene precursor and an oxygen donor with a catalyst comprising cobalt oxide and molybdenum oxide at a temperature above about 300° C.

4,292,457

ALKYLATION OF AROMATIC HYDROCARBONS

Marvin R. Klotz, Batavia, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 897,360, Apr. 18, 1978, which is a continuation-in-part of Ser. No. 733,267, Oct. 18, 1976, abandoned, Ser. No. 819,974, Jul. 28, 1977, abandoned, and Ser. No. 836,403, Sep. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 733,267,. This application Aug. 29, 1980, Ser. No. 182,792
Int. Cl.³ C07C *3/52, 15/00*
U.S. Cl. 585—447 **65 Claims**

1. A process for the alkylation of an aromatic hydrocarbon, which process comprises contacting a feed comprising said hydrocarbon under alkylation conditions and in the presence of an alkylating agent with a catalyst comprising a crystalline borosilicate which comprises a molecular sieve material providing an X-ray diffraction pattern comprising the following X-ray diffraction lines and assigned strengths:

d(Å)	Assigned Strength
11.2 ± 0.2	W-VS
10.0 ± 0.2	W-MS
5.97 ± 0.07	W-M
3.82 ± 0.05	VS
3.70 ± 0.05	MS
3.62 ± 0.05	M-MS
2.97 ± 0.02	W-M
1.99 ± 0.02	VW-M

and having the following composition in terms of mole ratios of oxides:

$0.9\pm0.2\ M_{2/n}O:B_2O_3:YSiO_2:ZH_2O,$

wherein M is at least one cation having a valence of n, Y is between 4 and about 600, and Z is between 0 and about 160.

4,292,458

PRODUCTION OF HYDROCARBONS FROM ALCOHOLS

Marvin R. Klotz, Batavia, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 897,360, Apr. 18, 1978, which is a continuation-in-part of Ser. No. 733,267, Oct. 18, 1976, abandoned, Ser. No. 819,974, Jul. 28, 1977, abandoned, and Ser. No. 836,403, Sep. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 733,267, , abandoned. This application Aug. 29, 1980, Ser. No. 182,691
Int. Cl.³ C07C *1/20, 11/00, 15/00*
U.S. Cl. 585—469 **50 Claims**

1. A process for the conversion of an alcohol to useful hydrocarbon products, which process comprises contacting a feed comprising said alcohol under suitable conversion conditions with a catalyst comprising a crystalline borosilicate which comprises a molecular sieve material providing an X-ray diffraction pattern comprising the following X-ray diffraction lines and assigned strengths:

d (A)	Assigned Strength
11.2 ± 0.2	W-VS
10.0 ± 0.2	W-MS
5.97 ± 0.07	W-M
3.82 ± 0.05	VS
3.70 ± 0.05	MS
3.62 ± 0.05	M-MS
2.97 ± 0.02	W-M
1.99 ± 0.02	VW-M

and having the following composition in terms of mole ratios of oxides:

$0.9\pm0.2\ M_{2/n}O:B_2O_3:YSiO_2:ZH_2O,$

wherein M is at least one cation having a valence of n, Y is between 4 and about 600, and Z is between 0 and about 160.

6. A process for the conversion of an alcohol to hydrocarbon products boiling in the gasoline boiling range, which process comprises contacting a feed comprising said alcohol under suitable conversion conditions with a catalyst comprising a crystalline borosilicate, said borosilicate comprising a molecular sieve material providing an X-ray diffraction pattern

comprising the following X-ray diffraction lines and assigned strengths:

d (A)	Assigned Strength
11.2 ± 0.2	W–VS
10.0 ± 0.2	W–MS
5.97 ± 0.07	W–M
3.82 ± 0.05	VS
3.70 ± 0.05	MS
3.62 ± 0.05	M–MS
2.97 ± 0.02	W–M
1.99 ± 0.02	VW–M

and having the following composition in terms of mole ratios of oxides:

$$0.9 \pm 0.2\ M_{2/n}O:B_2O_3:YSiO_2:ZH_2O,$$

wherein M is at least one cation having a valence of n, Y is within the range of about 4 and about 600, and Z is within the range of 0 to about 160.

4,292,459

COUPLING REACTION INVOLVING A GRIGNARD AND ALLYLIC HALIDE

Carlos G. Cardenas, and Zia Ud Din, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 596,273, Jul. 16, 1975, abandoned, Ser. No. 596,426, Jul. 16, 1975, abandoned, Ser. No. 596,274, Jul. 16, 1975, abandoned, and Ser. No. 596,361, Jul. 16, 1975, abandoned. This application Apr. 13, 1977, Ser. No. 786,973

Int. Cl.³ C07C *1/26*

U.S. Cl. 585—641 **10 Claims**

1. In the process for coupling a Grignard reagent RMgX, R being alkyl, alkenyl, vinyl, aryl, aralkyl, alicyclic, or alkadienyl, with a secondary allylic halide in the presence of a solvent to form an olefinic hydrocarbon, the improvement for obtaining improved yield and selectivity comprising

(a) adding a Kharasch reaction catalyst to said Grignard reagent or allylic halide, said solvent being a dipolar aprotic solvent, and then

(b) carrying out the coupling reaction by the addition of the Grignard reagent to the allylic halide, said reaction being characterized by cross-coupling and allylic rearrangement defined as displacement by the R group of the Grignard reagent at the gamma position relative to the halide of the allylic halide, migration of the double bond in the direction of the halide, and loss of halogen.

4,292,460

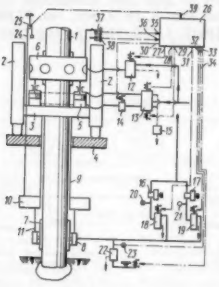
ELECTRODE-SLIPPING APPARATUS FOR ELECTRIC FURNACES

Jury F. Frolov, M. Muranovskaya ulitsa 11, korpus 1, kv.29, Moscow; Nariman A. Sukoian, Pamirskaya ulitsa, 48, kv.78, Novosibirsk; Ivan T. Proshkin, ulitsa Zorge, 5, kv. 30, Novosibirsk, and Anany M. Basalaev, ulitsa Rimskogo Korsakova, 7/1, kv. 15, Novosibirsk, all of U.S.S.R.

Continuation-in-part of Ser. No. 748,536, Dec. 8, 1976, abandoned. This application May 25, 1979, Ser. No. 42,339

Int. Cl.[3] H05B *7/10*

U.S. Cl. 13—14 11 Claims



1. In an electric furnace comprising an electrode, contact shoes effecting electric contact with the electrode and provided with clamp means and hydraulic mechanisms, and a hydraulic fluid pressure control unit including pressure-reducing valves and slide valves and set in the hydraulic fluid pressure and drain line of said hydraulic mechanisms and said clamp mechanism, an apparatus for continuous slipping of the electrode comprising:

a hydraulic hoist lifting the electrode and being rigidly connected with said clamp means, said hydraulic hoist including hydraulic plungers and a cross beam interconnecting said hydraulic plungers;

a support structure on which said hydraulic plungers are mounted;

hydraulic mechanisms enabling the slipping of said electrode and mounted on said cross beam of said hydraulic hoist;

a first slide valve controlling said electrode-slipping hydraulic mechanisms and being set in the hydraulic fluid pressure and drain line of the electrode-slipping hydraulic mechanisms;

a sliding spool flow control valve continuously effecting the meter-out flow control in the electrode-slipping hydraulic mechanisms, said sliding spool flow control valve being set between said hydraulic electrode-slipping mechanisms and said first slide valve in the fluid pressure and drain line and connected therewith;

a locking ring connected with said hydraulic electrode-slipping mechanisms and including gripping means intermittently holding said electrode;

a second slide valve controlling said locking ring and being set in the hydraulic fluid supply line of said locking ring and connected therewith;

an upper end switch limiting upward movement of said locking ring;

a lower end switch limiting downward movement of said locking ring; and

a programming device having six outputs respectively connected to spools of said first slide valve, said second slide valve, and said sliding spool flow control valve and to the hydraulic fluid pressure control unit, and two inputs respectively connected to said upper and lower end switches.

4,292,461

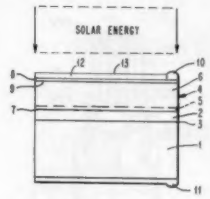
AMORPHOUS-CRYSTALLINE TANDEM SOLAR CELL

Harold J. Hovel, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1980, Ser. No. 161,550

Int. Cl.[3] H01L *31/04*

U.S. Cl. 136—249 9 Claims



1. In a tandem solar cell device where solar energy passes through a plurality of superimposed layers of photo-responsive materials, each layer converting principally different energy photons, the improvement comprising in combination:

a crystalline semiconductor substrate layer having a photo-responsive junction associated therewith;

an optically transparent conducting layer chosen from the group consisting of indium tin oxide, tin oxide, tin antimony oxide, cadmium stannate, and zinc oxide over said crystalline semiconductor layer;

an amorphous silicon light receiving layer over said optically transparent conducting layer;

a photo-responsive junction associated with said amorphous silicon layer; and

an ohmic contact to each of said amorphous Si solar cell structure and said crystalline semiconductor substrate layer.

4,292,462

LIQUID DIELECTRIC COMPOSITIONS COMPRISING BROMOCHLOROBENZENE/POLYCHLOROBENZENE ADMIXTURES

Bruno Rey-Coquais, Lyons, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Mar. 18, 1980, Ser. No. 131,488

Claims priority, application France, Mar. 21, 1979, 79 07713

Int. Cl.[3] H01B *3/24*

U.S. Cl. 174—17 LF 36 Claims

1. A liquid, non-flammable dielectric composition, comprising (i) a bromochlorobenzene fraction, and (ii) a polychlorobenzene fraction including a member selected from the group consisting of at least one trichlorobenzene, at least one tetrachlorobenzene, and admixtures thereof.

4,292,463

CABLE SHIELDING TAPE AND CABLE

Kenneth E. Bow, Lake Jackson, Tex., and Thomas H. Lyon, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 860,368, Dec. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 673,842, Apr. 5, 1976, abandoned. This application Sep. 17, 1979, Ser. No. 76,035

Int. Cl.[3] B32B *15/08;* H01B *7/18, 7/22*

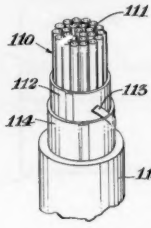
U.S. Cl. 174—107 16 Claims

15. An improved cable adapted for use in supplying electrical power and communications comprising a core of at least one insulated conductor, a shield surrounding said core comprising

(1) a metal strip having tightly and directly adhered to one side thereof a first adhesive layer composed of a copolymer of ethylene and from about 2 to about 20 percent

based on copolymer weight of an ethylenically unsaturated carboxylic acid; and

(2) a first deformation resistant layer composed of a polymeric resinous material tightly adhered to said first adhesive layer, said first deformation resistant layer having a deformation temperature of at least about 270° F. and



positioned inwardly in the direction of said core and an outer plastic jacket surrounding said shield, the adhesive bond between said metal strip and said first adhesive layer and between said first adhesive layer and said first deformation resistant layer being at least 2.2 pounds per inch of shielding tape width after aging for seven (7) days in deionized water maintained at a temperature of 70° C.

4,292,464

GLASS PASS THROUGH WITH AN ADDITIONAL INSULATOR FOR LENGTHENING LEAKAGE PATH

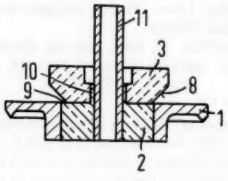
Herbert Vogt; Lothar Wassill, and Christian Wengler, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 973,529

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1978, 2800696

Int. Cl.³ H01B *17/26;* **H01L** *23/02*

U.S. Cl. 174—152 GM **2 Claims**



1. A power semiconductor component, comprising a glass part having at least one end face, a metal case part having an opening formed therein in which said glass part is disposed and sealed to said metal case part, a ceramic ring having a planar end face and an outer diameter which is larger than the opening in said metal case part, said ceramic ring being connected at said end face thereof to said at least one end face of said glass part, at least one electric conductor extending through said glass part and an opening formed in said ceramic ring, said at least one electric conductor having an outside diameter which is smaller than the diameter of the opening in said ceramic ring forming a space therebetween, and glass disposed in said space sealing said glass part and said ceramic part to said at least one electric conductor, said connection between said ceramic ring and said glass part comprising a glass fusion-melt, said end face of said ceramic ring connected to said glass part having a bevel formed at the periphery thereof extended beyond the opening in said metal case part, forming a capillary gap for said glass fusion-melt and leaving a diameter inside said bevel at the periphery which is smaller than the diameter of the opening in said metal case part.

4,292,465

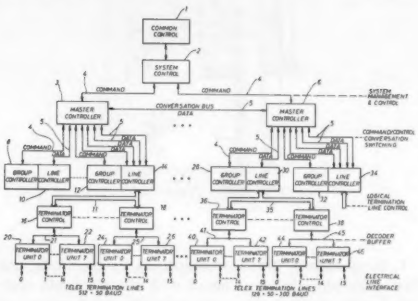
DISTRIBUTED PROCESSING TELEX EXCHANGE

John F. Wilson; Edward D. Hoover; Philip K. Hammond, all of Woodland Hills; William A. Moshier, Arleta; Jack L. Woodell, La Canada; John W. Spaniol, Studio City, all of Calif.; John J. Bowerman, Rock Ridge, Md.; Larry C. Bieber, Simi Valley, and Marvin Perlman, Granada Hills, both of Calif., assignors to Frederick Electronics Corporation, Frederick, Md.

Filed Nov. 6, 1979, Ser. No. 92,066

Int. Cl.³ H04L *11/00;* **H04Q** *3/54;* **G06F** *11/00*

U.S. Cl. 178—3 **60 Claims**



1. A distributed processing telecommunications switch having different levels of processor control for handling conversation calls between terminations connected to the switch, the switch comprising:

(a) a common control processor, for system-wide management and control of each termination connected to the switch, said common control occupying the highest level of processor control;

(b) a command data bus, for coupling command data signals between said common control and the processors in the lower levels of processor control;

(c) at least one master controller processor connected by said command bus to said common control, for command bus data switching between said common control and the lower levels of processor control, and for handling the conversation data for a first predetermined number of terminations under its control by storing in each said master controller processor the conversation data generated by each termination connected to the switch, said master controller processor occupying the next lower level of processor control from said common control;

(d) at least one group controller processor connected by said command bus to an associated one of said master controller processors, for supervising the processing of the data signals in each of a second predetermined number of terminations, said group controller processors occupying the next lower level of processor control from said master controller processors;

(e) a conversation data bus, for coupling the conversation data of the terminations to and between said master controller processors; and

(f) a line controller processor associated with each said group controller processor and responsive thereto, for transmitting to and receiving from the second predetermined number of terminations, data signals indicative of the signaling levels in these terminations, said line controller processor connected by said conversation bus to said master controller processor associated with said group controller processor that said line controller processor is associated with, said associated group controller and line controller processors cooperating to-

gether to produce the required signaling sequences between the switch and the terminations to service a call from or to a termination, said line controller processors occupying the lowest level of processor control.

4,292,466

CIRCUIT ARRANGEMENT FOR RECEIVING UNIPOLAR DC SIGNALS

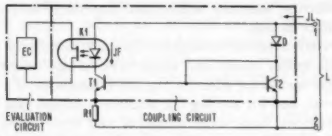
Giselher Eckel, Mount Laurel, N.J., assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,290

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2933847

Int. Cl.³ H04M *1/26*

U.S. Cl. 178—3 **11 Claims**



1. A circuit arrangement for receiving unipolar direct current signals from a receiving branch of a transmission line of a telecommunication system and for supplying said DC signals to an evaluation circuit having adjustable threshold value characteristics for evaluating said DC signals, said circuit arrangement comprising:

(a) an opto-coupler circuit having a light-emitting element associated with an input side and a light-receiving element associated with an output side; said input side coupled to the receiving branch of the transmission line and said output side connected with said evaluation circuit; and

(b) a first current reflector circuit arranged at the input side of said opto-coupler circuit and being composed of both a first and a second transistor, forming a transistor pair with a common base connection, as well as a resistor;

(b1) said first transistor being connected by its collector-emitter-path in series with said light-emitting element;

(b2) said second transistor being symmetrically arranged in parallel to the series connection of said light-emitting element and said first transistor; and

(b3) said resistor being arranged in the emitter circuit of one of said transistors for controlling a current reflection ratio of said current reflector circuit.

4,292,467

CONTROL FOR AUDIO RECEIVER

Lars Odlen, Lund, and Anders Hansson, Trelleborg, both of Sweden, assignors to Transcale A.B., Vesteras, Sweden

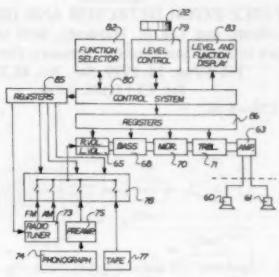
Filed Oct. 4, 1978, Ser. No. 948,422

Claims priority, application Sweden, Oct. 7, 1977, 7711298

Int. Cl.³ H03G *5/02*

U.S. Cl. 179—1 D **19 Claims**

15. Control apparatus for an audio receiver having a plurality of audio signal processing devices each providing a variable modification in an associated characteristic of an associated audio signal comprising a plurality of electrically controllable means each associated with a corresponding one of said audio signal processing devices for setting the extent of modification of the associated audio signal, a plurality of addressable registers each coupled to a corresponding one of said electrically controllable means for storing and providing to the associated electrically controllable means a digital signal determining the extent of modification of the associated audio signal, a single adjusting means for providing adjustment signals indicating the magnitude and direction of a desired change in signal processing by a selected signal processing means, a memory for storing the addresses of said addressable registers and their respectively associated digital signals, means for selecting one of said audio signal processing devices for adjustment, display means, and control means for causing said display means to display an indication of the extent of signal modification being provided by the selected audio signal processing device, for determining



an adjusted digital signal for the selected audio signal processing device in accordance with said adjustment signal and for providing said adjusted digital signal to said register for the selected audio signal processing device.

4,292,468

FREQUENCY SELECTION CIRCUIT

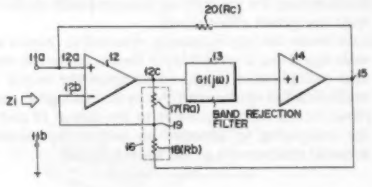
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 22, 1979, Ser. No. 41,322

Claims priority, application Japan, Jun. 9, 1978, 53-69515

Int. Cl.³ H03J *5/04*; H03G *5/02*

U.S. Cl. 179—1 D **10 Claims**



1. A frequency selection circuit having a circuit impedance, and resonance frequency, comprising:

an operational amplifier having an inverting input, a noninverting input and an output, said noninverting input of said operational amplifier being connected to receive an input signal;

a band rejection filter circuit having an input and an output, the input of said band rejection filter circuit being coupled to said output of said operational amplifier, for controlling the resonance frequency of the frequency selection circuit;

a voltage divider circuit connected between said output of said operational amplifier and said output of said band rejection filter circuit, and having an output coupled to said inverting input of said operational amplifier for controlling the quality factor of the frequency selection circuit; and

a feedback resistor coupled between said output of said band rejection filter circuit and said non-inverting input of said operational amplifier for determining the circuit impedance of the frequency selection circuit;

wherein the circuit impedance of the frequency selection circuit depends solely on the feedback resistor, and the quality factor of the frequency selection circuit depends solely on the dividing factor of the voltage divider circuit,

and wherein the resonance frequency of the frequency selection circuit is controlled by the band rejection filter circuit independently of said circuit impedance and said quality factor.

4,292,469

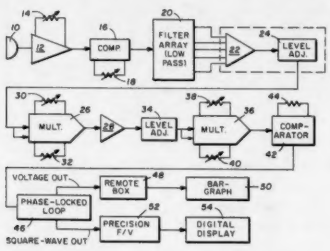
VOICE PITCH DETECTOR AND DISPLAY

Brian L. Scott, and Lee H. Hardesty, both of Denton, Tex., assignors to Scott Instruments Company, Denton, Tex.

Filed Jun. 13, 1979, Ser. No. 48,238

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—1 SC **21 Claims**



1. Apparatus for analyzing the acoustic components of a speech signal, comprising:

a low pass filter array, each filter of the array responsive to all of the acoustic components of a speech signal representative of human voice and passing selected speech frequencies to an output,

means for summing the output of each filter into a composite signal,

multiplication means connected to the output of said means for summing for multiplying the composite signal with at least one preset offset signal,

circuit means having one input connected to receive a hysteresis signal and a second input connected to the output of said multiplication means to compare the output of said multiplication means with the hysteresis signal, and

a phase locked loop responsive to the output of said means for comparing to generate an output representing the acoustic components of the speech signal.

4,292,470

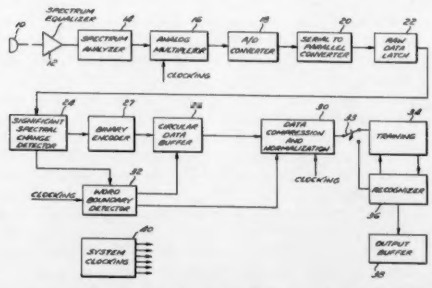
AUDIO SIGNAL RECOGNITION COMPUTER

Byung H. An, Anaheim, Calif., assignor to Interstate Electronics Corp., Anaheim, Calif.

Filed Sep. 10, 1979, Ser. No. 73,792

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—1.5 D **9 Claims**



1. A signal pattern encoder including a transducer, a signal processing assembly coupled to the output of said transducer for providing spectrum samples representative of the signal output of said transducer and a timing and control assembly connected to said signal processing assembly wherein the improvement comprises:

event encoding logic means coupled to the output of said signal processing assembly and also coupled to said timing and control assembly for computing the difference between a current spectrum sample and the last previous spectrum sample accepted by said event encoding logic means;

first means responsive to said event encoding logic means for rejecting said current spectrum sample if said difference is below a predetermined value;

second means responsive to said event encoding logic means for encoding said current spectrum sample into a binary signal if said difference is above said predetermined value;

circularly addressed data buffer means connected to said encoding means for continuously storing said encoded spectrum samples within said circularly addressed data buffer means;

an event detector connected to said circularly addressed data buffer means and responsive to said event encoding logic means for determining the boundaries of a particular event, and for storing the addresses within said circularly addressed data buffer means of said boundaries; and

third means connected to said circularly addressed data buffer means and responsive to said event detector for reading data relating to said particular even from said circularly addressed data buffer means.

4,292,471

METHOD OF VERIFYING A SPEAKER

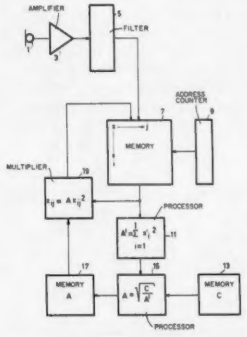
Michael H. Kuhn, Hamburg, and Horst Tomaschewski, Stuvenborn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1979, Ser. No. 83,197

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1978, 2844156

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—1 SB **9 Claims**



1. An improved method of verifying a speaker from which a number of reference speech samples have been obtained, a number of characteristics having been derived in the same manner from each reference speech sample, the mean value of the values of each characteristic of all reference speech samples having been determined from the characteristic values of all reference speech samples, a distance value having been determined, the characteristic mean values and the distance value having been stored; and characteristics from a speech sample to be verified having been derived in the same manner and the distance of this speech sample from the center point given by the characteristic mean values having been formed from the sum of the squares of the differences between each characteristic value of the speech sample and the associated

characteristic mean value, an O.K. signal having been generated when the sum at the most equals the distance value, characterized in that:

determining and storing a separate distance value from the differences between the characteristic values of two reference speech samples of at least a part of all reference speech samples;

storing the characteristic values of additional reference speech samples within the range defined by the center point and the distance value in the separate range of which, defined by the relevant reference speech sample and the separate distance value, the largest number of further reference speech samples are situated, said separate range being situated partly outside said range;

the distance of the speech sample to be verified being determined also with respect to the reference speech samples and being compared with the separate distance value;

storing, in addition, the characteristic values of reference speech samples which are situated outside the range defined by the center point and the distance value, for the verification of a speech sample to be verified whose distance from the center point is larger than the distance value;

successively determining and comparing the distance from the additionally stored reference speech samples with the stored separate distance value and

generating an O.K. signal if at least one distance is smaller than the separate distance value.

4,292,472

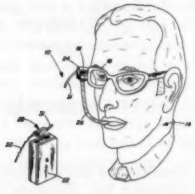
ELECTRONIC ARTIFICIAL LARYNX

Thomas M. Lennox, 7670 Acacia Ave., Mentor, Ohio 44060

Continuation-in-part of Ser. No. 70,851, Aug. 29, 1979, abandoned. This application Feb. 14, 1980, Ser. No. 121,300

Int. Cl.³ A61F *1/20;* **G10I** *1/10*

U.S. Cl. 179—1 AL **10 Claims**



10. In an electronic artificial larynx having a tone generator and a signal generator, the improvement comprising:

(a) clamping means for supporting the tone generator and attaching it to a pair of eyeglasses;

(b) a band adapted to fit securely around a human limb;

(c) a switch attached to the band for operating the artificial larynx; and,

(d) a switch actuator to actuate the switch in response to movement of the limb.

4,292,473

LOOP SUPERVISION CIRCUIT

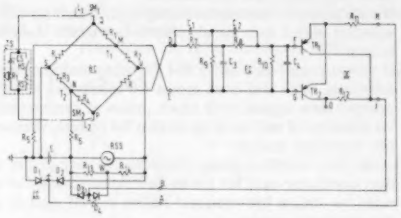
Jan H. G. Venken, Schilde, and Jozef A. M. Robijns, Heers, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 6, 1979, Ser. No. 64,344

Int. Cl.³ H04M *3/02, 3/22*

U.S. Cl. 179—18 FA **21 Claims**

1. Impedance network for monitoring the condition of a line, said network including a source having a DC component and an AC component, a DC detector circuit, a multiport impedance bridge network, said line coupled to one port of said bridge network, said source coupled to the opposed port of the bridge network and said detector circuit coupled to an output port of said bridge network formed by intermediate tapping of impedances in opposed arms of said bridge network, a filter circuit associated with said DC detector circuit to substantially prevent said AC component from having an influence on the operation of said DC detector circuit, said detector circuit



having at least one terminal at a fixed DC potential, the invention wherein said terminal is coupled to said source to apply a potential having an AC component to the detector circuit cancelling the effect of any AC signal present on the terminals of an input port to said DC detector circuit from said bridge network.

4,292,474

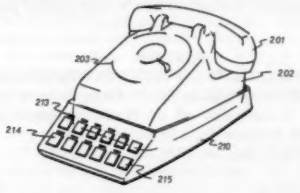
ELECTRONIC KEY TELEPHONE SYSTEM WITH BI-DIRECTIONAL SERIAL DATA STREAM STATION CONTROL

Wilfred L. Morrell, Boca Raton, and William M. Levine, Lauderdale Lake, both of Fla., assignors to OKI Electronics of America, Inc., Ft. Lauderdale, Fla.

Filed Aug. 13, 1979, Ser. No. 66,474

Int. Cl.³ H04Q *5/18*

U.S. Cl. 179—99 M **14 Claims**



1. In an electronic key telephone system using time division multiplexing for the communication of command, status and supervisory signals among functional circuit elements, and including a group of stations each equipped with audible signaling means and nonlocking key switches with associated lamp indicators, each station having access to a plurality of communication lines by means of an individual speech conductor pair, a central processor module for controlling the connection and intercommunication of signals between said lines and stations, and by an individual data conductor pair associated with each of said stations for the bi-directional communication of data control signals, the improvement comprising:

central processor electronic timing means, including a system clock for generating a clock pulse stream;

central processor logic means for generating unipolar digital data signals common to each station;

central processor multiplex means for interlacing said common data signals with clock pulses of said clock pulse stream to form a serial bit stream, each bit position of which begins with a clock pulse and includes either zero or a one data information;

said timing means including bit counting means for dividing said serial bit stream into repetitive frames of a predetermined number of bit positions;

a station circuit module associated with each station and connected thereto by a separate speech conductor pair and data conductor pair;

a line circuit module associated with each communication line;

plural bus means for intermodule communication of clock pulse and data signal information;

said station circuit module including latch means for storing unipolar digital data signals proprietary to the associated station;

said station circuit module further including multiplex means associated with said latch means for interlacing said proprietary data signals with clock pulses at predetermined bit positions of said serial bit stream for communication to the associated station;

separate data interface means connected to each end of said data conductor path for the bi-directional transfer of said serial bit stream between said station circuit module and the associated station;

first data separator means associated with the station data interface means for separating data signals from the clock pulses of selected positions of said serial bit stream;

station latch means for storing said separated data signals, and associated decoding means operative on said stored data signals for controlling said lamp indicators and audible signalling means

station multiplex means associated with the station interface means and connected to the output of said nonlocking key switches for interlacing unipolar digital key switch data signals with clock pulses at predetermined bit positions of said serial bit stream for communication to said station circuit module;

station circuit data separator means associated with said station circuit data interface means for separating said key switch data signals from the clock pulses of said serial bit stream; and

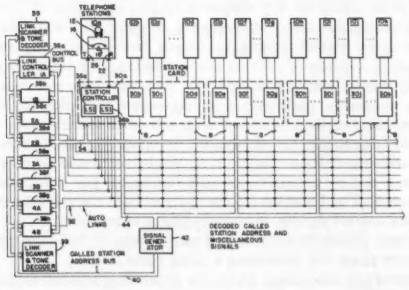
station circuit output latch means associated with said station circuit data separator means for storing key switch data signals for communication to said central processor.

4,292,475

EXPANDABLE LINK TELEPHONE INTERCOM SYSTEM

Stephen R. Hill, Seattle; Victor M. De Pinto, Bellevue, and John D. Gillen, Woodinville, all of Wash., assignors to Tone Commanders Systems, Inc., Redmond, Wash.

Filed Aug. 28, 1979, Ser. No. 70,403
Int. Cl.[3] H04M *9/00*
U.S. Cl. 179—99 A **7 Claims**



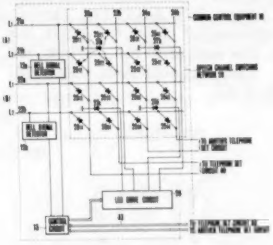
1. A telephone intercom system comprising a plurality of self-contained station controllers each adapted to connect a respective telephone station to one of M audio links to make or receive a telephone call, and each having an operating cycle of M equal operating periods during which a calling station controller searches for and then connects itself to a corresponding available audio link and a called station receives an enabling signal derived from a station address generated by the calling station and connects itself to the audio link to which the calling station is connected, said system including means for allowing N of said system controllers to operate in parallel for each station to selectively connect said station to one of M×N audio links, each of said audio links being controlled by a respective link controller which receives the station address of the called station from the calling station, decodes the address and applies the address in time-multiplexed form to a plurality of demultiplexers associated with the respective stations during one of N address valid periods of the M operating periods corresponding to the one of M×N audio links to which the calling station is connected to allow the demultiplexer for the called station to decode said time division multiplexed address and apply said enabling signal to the one of N station controllers corresponding to the one of N address valid periods of said operating period.

4,292,476

SPEECH CHANNEL SWITCHING NETWORKS SUITABLE FOR USE IN COMBINATION WITH ELECTRONIC KEY TELEPHONE SETS

Kazuyuki Yamamoto, and Seiei Ohkoshi, both of Yokohama, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Oct. 11, 1979, Ser. No. 83,897
Claims priority, application Japan, Oct. 18, 1978, 53-127399
Int. Cl.[3] H04Q *3/52*
U.S. Cl. 179—99 R **3 Claims**

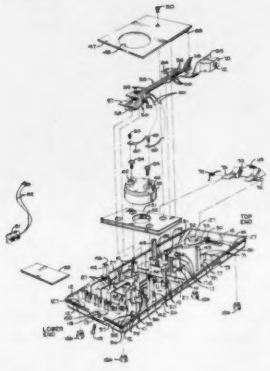


1. In a speech channel switching network adapted to be used in combination with an electronic key telephone set of a key telephone system including an electronic speech channel switching circuit, and an electronic key telephone set adapted to be selectively connected to central office lines by said speech channel switching circuit, the improvement wherein said speech channel switching circuit comprises first and second incoming lines for connection to a pair of central office lines; first and second outgoing lines connected to a telephone set circuit of said electronic key telephone set, said incoming lines and said outgoing lines being arranged in a matrix; and four controllable unidirectional switching elements each disposed at a different one of four cross-points between said incoming and outgoing lines, a first one of said unidirectional switching elements being connected between said first incoming line and said first outgoing line with a first polarity, a second one of said unidirectional switching elements being connected between said first incoming line and said second outgoing line with a polarity opposite that of said first polarity, a third one of said unidirectional switching elements being connected between said second incoming line and said first outgoing line with said first polarity, and a fourth one of said unidirectional switching elements being connected between said second incoming line and said second outgoing line with a polarity opposite that of said first polarity, so that the polarity of current flowing along said outgoing lines is unaffected by the relative polarity of signals on said incoming lines.

4,292,477
TELEPHONE SET BASE FOR BOTH WALL AND DESK MOUNTING

William J. Adams, Franklin, and Steve W. Haskins, Laverne, both of Tenn., assignors to Northern Telecom, Inc., Ottawa, Canada

Filed Sep. 25, 1979, Ser. No. 78,674
Int. Cl.³ H04M *1/02*
U.S. Cl. 179—100 C **17 Claims**



1. A telephone set base for both wall and desk mounting, comprising:

an elongate molded plastic base plate having a base member and an upstanding peripheral rim extending around the base member, said rim including a lateral slot therein;

an enclosed recess extending upward from said base member for containing therein a first modular plug adapted for plugging into a wall outlet jack;

a further recess extending upward from said base member adjacent to said enclosed recess, said further recess including snap means for retention of a modular jack and an aperture defining a passage communicating with said enclosed recess for receiving a short first line cord connected between the first modular plug and a second modulator plug connected to the modular jack;

said base plate including an inlet at one end for a long second line cord and a cord slot connecting said inlet and said enclosed recess for receiving the second line cord as it passes from said inlet to said further recess;

a flat weight having an aperture therein and being spaced from said base member, defining therewith an acoustic chamber, said chamber being enclosed at its periphery and said lateral slot in said peripheral rim opening into said acoustic chamber;

a speaker mounted on said weight at said aperture;

a printed circuit board mounted over said flat weight; and

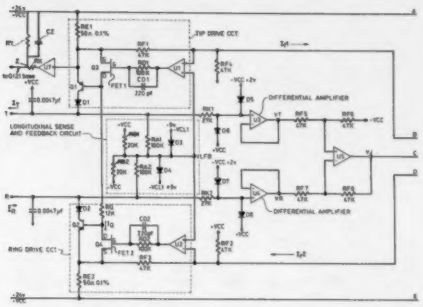
a flexible circuit member having at least one modular jack mounted thereon, said flexible circuit member interconnecting said speaker and said printed circuit board, said modular jack being retained at said further recess by said snap means;

whereby said telephone set base is adapted to have the short first line cord extend from said enclosed recess to said further recess with said first modular plug on one end of the cord being positioned in said enclosed recess and with said second modular plug on the other end of said first line cord being connected to said modular jack retained by said snap means above said further recess when the telephone is in a wall mounted form, and the telephone base set base is adapted to have the long second line cord enter said inlet and pass along said cord slot to said enclosed recess and then through said passage to said further recess where it is connected with said modular jack retained by said snap means above said further recess when the telephone is in a desk mounted form.

4,292,478
INTERFACE CIRCUITS

John C. H. Davis, Oak Ridges, and Krishnaswamy Natarajan, Bramalea, both of Canada, assignors to Plessey Canada Limited, Downsview, Canada

Filed May 25, 1979, Ser. No. 42,530
Int. Cl.³ H04B *1/58*
U.S. Cl. 179—170 NC **30 Claims**



1. Means for providing power to a pair of lines comprising :

means for connecting a positive voltage datum over the main conduction path of a first transistor to create a relatively positive voltage on such line,

means for connecting the other line over the main conduction path of a second transistor to a negative voltage datum, to create a relatively negative voltage on said other line,

where the high impedance power terminals of said first and second transistors are connected to said lines and the low impedance power terminals are connected to said datums,

means for controlling current flow through the respective conducting path of each of said transistors,

means for obtaining a measure of the sum of the voltages on said pair of lines,

means responsive to the said sum being more negative and more positive, for co-operating with said respective controlling means to increase and decrease, respectively, current flow along said main conducting path of said first transistor from said positive datum; and to decrease and increase current flow along said main conducting path of said second transistor to said negative datum.

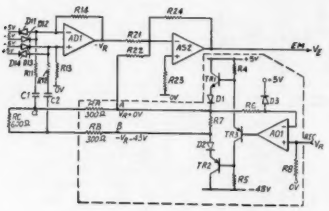
4,292,479
SEPARATION AND BALANCE DEVICE FOR TELEPHONE EXCHANGES

Andre Chataignon, Argenteuil; Alain Nicolas, Courbevoie, and Jean P. Poirier, Saint Denis, all of France, assignors to Le Materiel Telephonique Thomson-CSF, Colombes, France

Filed Sep. 14, 1979, Ser. No. 75,799
Claims priority, application France, Sep. 19, 1978, 78 26822
Int. Cl.³ H04B *1/58*
U.S. Cl. 179—170 NC **11 Claims**

1. An electronic separation and balance device comprising a first two-to-four wire converter circuit connected between subscriber's telephone set lines and a four wire path, and a second two-to-four wire converter circuit connected between the four wire path and a network junctor, wherein said first two-to-four wire converter circuit comprises: first, second and third operational amplifiers, the input of said first amplifier being connected to the receive wires of the four wire path, and its output being connected to a transistor circit for forming a DC amplifier the balanced outputs of which are connected to the subscriber's telephone set lines through resistors of equal

value, each of the inputs of said second amplifier being connected to the subscriber's telephone set lines through a capacitor in series with a resistor, and the (negative) input of said third amplifier being connected to the output of the second amplifier through a resistor and to one output of said DC amplifier through another resistor, the output of said third amplifier being connected to the transmit wires of the four wire path; means for preventing the voltages on inputs of said second and third amplifiers from being higher than a given positive low voltage and from being lower than a given negative low voltage; and means for preventing the voltage on the inputs of said first amplifier from being higher than a given



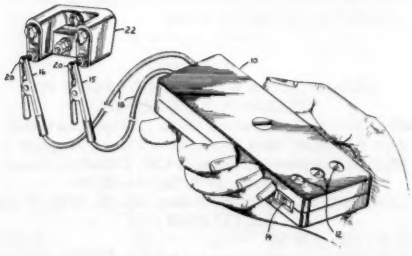
positive low voltage; and wherein said second two-to-four wire converter comprises first, second and third operational amplifiers, said first and second amplifiers being connected to the transmit wires of the four-wire path, their outputs being coupled through resistors of equal value to the inputs of the network junctor, the (negative) input of said third amplifier being connected through a passive R.C. network to the output of said first amplifier, the (positive) input of said third amplifier being connected through a resistor to the input of the network junctor which is coupled to the output of said first amplifier, the output of said third amplifier being connected to the receive wires of the four-wire path.

4,292,480

METHOD AND APPARATUS FOR LOCATING TELEPHONES

Robert L. Sweatt, Decatur, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,891
Int. Cl.³ H04M *1/24*
U.S. Cl. 179—175.2 B **8 Claims**



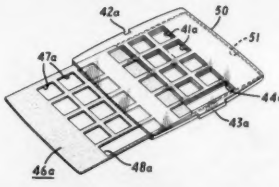
1. A method of determining the presence of an out-of-service telephone within a building, said telephone connected to a building interior telephone loop that is coupled with a building exterior telephone loop, without having to enter the building, and with the method comprising the steps of electrically isolating the interior loop from the exterior loop; determining if the electrical resistance of the interior loop is within a selected resistance range; determining if the electrical capacitance of the interior loop exceeds a selected capacitance level; and generating a telephone present signal should either the determined resistance be within the selected resistance range or the determined capacitance exceed the selected capacitance level.

4,292,481

DECORATIVE APPLIQUE AND DECORATIVE FACEPLATE ASSEMBLY FOR PUSH-BUTTON TELEPHONES

Wayne R. Barnes, and Lawrence K. Barnes, both of 207 E. 17th St., New York, N.Y. 10003

Filed Jul. 16, 1975, Ser. No. 596,220
Int. Cl.³ H04M *1/02*
U.S. Cl. 179—178 **3 Claims**



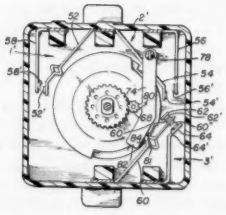
1. A decorative faceplate assembly for a push-button telephone comprising: a transparent faceplate configured for use on a push-button telephone and having plural openings therein located so as to overlie respective ones of the telephone push-buttons when the faceplate assembly is installed on a push-button telephone, said transparent faceplate having therein a slot dimensioned to receive a decorative applique; and a decorative applique removably inserted into said slot and containing on the top surface thereof a decorative design which is visible through said transparent faceplate and having plural openings therein superposed over respective ones of the plural faceplate openings.

4,292,482

CIRCUIT CONTROLLER FOR ANTI-WRINKLE CONTROL

Steven W. Smock, Indianapolis, and George W. Adams, Greenwood, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Dec. 3, 1979, Ser. No. 99,914
Int. Cl.³ H01H *43/10*
U.S. Cl. 200—38 R **7 Claims**



1. In an apparatus wherein a cam means is rotatably driven by a motor drive means and wherein first electrical switch means is responsive to said cam means to be opened and closed in accordance with a program of said cam means, means providing an extra program of short switching pulses, comprising:

(a) a gear train coupled between said motor drive means and said cam means, said gear train including program means providing said extra program,

(b) follower means engaging said program means to be actuated in accordance with said extra program,

(c) second electrical switch means responsive to said follower means to be opened and closed thereby, and

(d) locator means engaging said second electrical switch means to selectively position same into and out of an operable position with said follower means.

4,292,483

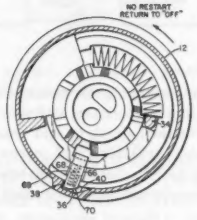
IGNITION SWITCH WITH STARTER LOCKOUT

Leo F. Roytberg, Brookline, Mass., assignor to Joseph Pollak Corporation, Boston, Mass.

Filed Feb. 27, 1980, Ser. No. 125,175

Int. Cl.³ H01H *27/06*

U.S. Cl. 200—42 A **6 Claims**



1. In a rotary switch having a stationary element and a rotary element, said rotary element being rotatable relative to said stationary element from one position to another to selectively energize circuits in a predetermined sequence, apparatus for preventing repeated energization of one of said circuits by movement in a first direction of said rotary element from a given position directly to a position adjacent thereto comprising a third element in frictional contact and normally rotatable with said rotary element, stops being provided on said stationary element to limit rotation of said third element with said rotary element, a fourth element rotatable with said rotary element and movable along said third element upon said third element engaging one of said stops on said stationary element and means disposed on said stationary element for engaging said fourth element, said third element having a portion thereof relieved to permit orthogonal movement of said fourth element relative thereto, said orthogonal movement resulting in engagement of said fourth element by said means disposed on said stationary element, the position of one of said stops and the position of said relieved portion of said third element being such that said fourth element is aligned with the relieved portion after the rotary element has been rotated beyond said given position in said first direction.

4,292,484

RESPONSIVE DEVICE FOR A VEHICLE TIRE

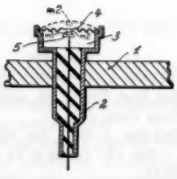
Günter Pruss, Amselweg 3, 2211 Wrist, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,477

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1978, 2818027; Aug. 9, 1978, 2834808

Int. Cl.³ H01H *35/24*

U.S. Cl. 200—61.25 **14 Claims**



1. In a device for signalling a pressure loss in the inner space of a tire mounted on a vehicle wheel; said device including mounting means for securing the device to said wheel; housing means defining a chamber projecting into said inner space; a diaphragm secured to said housing means and sealing said chamber from said inner space, whereby opposite faces of the diaphragm are exposed to pressures prevailing in said chamber and in said inner space, respectively; said diaphragm constituting a movable electrical contact; a stationary electric contact supported in said housing; said diaphragm having a first position in which said diaphragm is in electric contact with said stationary contact and a second position in which said diaphragm is electrically separated from said stationary contact; said diaphragm being moved from said first position into said second position when the pressure in said inner space drops below a predetermined value; the improvement comprising a valve means supported in said housing means, said valve means communicating with said chamber and being accessible externally of said wheel for sealing said chamber with respect to ambient atmosphere and for providing for a variability of the pressure in said chamber at will and further wherein said diaphragm is in a relaxed state in said first position and in a stressed state in said second position.

4,292,485

LEVER SWITCH WITH IMPROVED ACTUATING MEMBER

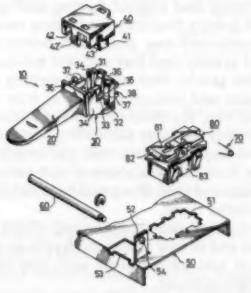
Shiro Kondo, and Michitada Akazawa, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1979, Ser. No. 93,909

Claims priority, application Japan, Nov. 18, 1978, 53-159230[U]

Int. Cl.³ H01H *3/06*

U.S. Cl. 200—332 **8 Claims**



1. A lever switch comprising

(a) a base frame having supports for a mounting rod;

(b) a switch body secured to said base frame, said switch body having an actuator pivotably mounted thereon and having an engaging portion at an end portion thereof;

(c) an actuating member having an elongated operating portion and a base portion, said base portion comprising a first slot extending downwardly from the top edge of said base portion for guiding said mounting rod upon its insertion, a second slot adjacent said first slot for supporting said mounting rod, and an engaging member for engaging with said engaging portion of said actuator of the switch body;

(d) a cover plate connected to said base portion of said actuating member for holding said actuating member on said mounting rod, and

(e) a fastening means for connecting said actuator member with said cover member.

4,292,486

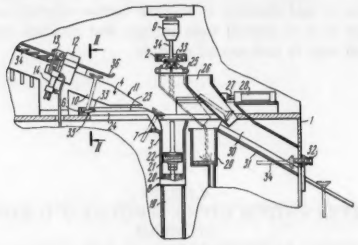
APPARATUS FOR DELIVERY OF MELTING RINGS AND VALVES TO AN INDUCTOR HEATER

Daniil A. Dudko, ulitsa Anri Barbjusa, 22/26, kv. 113; Anatoly A. Mozzhukhin, ulitsa Grodnenskaya, 3/5, kv. 37, both of Kiev; Vladimir V. Breze, ulitsa Revoljutsionnaya, 12, kv. 40, Tolyatti; Anatoly E. Kozlov, ulitsa Revoljutsionnaya, 73, kv. 85, Tolyatti; Veniamin G. Grigoriev, ulitsa Jubileinaya, 110, kv. 87, Tolyatti; Vladimir P. Sotchenko, ulitsa P. Tychiny, 13, kv. 210, Kiev; Boleslav I. Maximovich, ulitsa Anri Barbjusa, 22/26, kv. 107, Kiev; Bogdan P. Budzan, Dneprovskaya naberezhnaya, 11, kv. 122, Kiev, and Vitaly V. Zavodian, bulvar Lepse, 55, kv. 20, Kiev, all of U.S.S.R.

Filed Dec. 18, 1979, Ser. No. 104,712

Int. Cl.³ H05B *5/00*; B23K *13/00*

U.S. Cl. 219—9.5 **4 Claims**



1. An apparatus for delivery of melting rings and valves to an inductor heater, for hard facing of said valves by melting said melting rings upon a working surface of said valves, comprising:

an inductor heater;

a tubular body installed vertically under said inductor heater;

a first gravity feed tray for feeding said valves;

a second gravity feed tray for feeding said melting rings;

a horizontal feed tray positioned between an exit of said second gravity feed tray and said tubular body and under said first gravity feed tray, said melting rings being delivered onto said horizontal feed tray from said second gravity feed tray, the distance between sliding surfaces of said first gravity feed tray and sliding surfaces of said horizontal feed tray being less than the length of stems of said valves, such that said stems of said valves engage respective rings and slide along said horizontal feed tray toward said tubular body;

a stop positioned near an upper end of said tubular body and near an end of said horizontal feed tray and orienting said valve in said tubular body with said stem of said valve upwardly directed;

a pusher positioned under said tubular body and delivering said valve and said melting ring to said inductor heater; and

a clamping mechanism for holding said valve and melting ring within said inductor heater.

4,292,487

METHOD FOR INITIATING THE FLOAT ZONE MELTING OF SEMICONDUCTORS

Noel De Leon, Frederikssund, Denmark, assignor to Topsil A/S, Frederikssund, Denmark

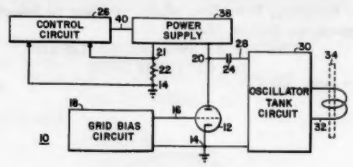
Continuation of Ser. No. 904,105, May 8, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,997

Claims priority, application Denmark, Jul. 7, 1977, 3063/77

Int. Cl.³ H05B *6/30*

U.S. Cl. 219—10.43 **4 Claims**

1. An improved method for initiating the float zone melting of semiconductor material using an apparatus which includes an induction heating coil for heating said semiconductor material, said induction heating coil being driven from an oscillator including a triode and having a switchable energy source, the improvement comprising the steps of: delivering current from said energy source to the anode of said triode to transfer energy to said inductive heating coil; maintaining said current to said anode constant to effect a controlled slow rate of induction heating of said semiconductor material to a first temperature below its melting temperature, said slow rate of induction heating reducing thermal shock to said semiconductor material; and subsequently switching said energy source to a constant voltage mode to induction heat said semiconductor material to a second temperature higher than said first temperature.



4,292,488

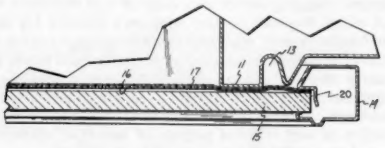
MICROWAVE OVEN DOOR HAVING A CONFORMABLE SCREEN

Earl Birk, Sioux Falls, S. Dak., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 25, 1980, Ser. No. 162,983

Int. Cl.³ H05B *6/76*

U.S. Cl. 219—10.55 D **7 Claims**



1. A microwave oven door comprising a frame, a sheet of substantially flat glass mounted in said frame, said frame substantially encircling said glass, a flexible metal screen overlying and substantially coplanar with said sheet of glass and mounted in said frame, the edges of said screen being deformed away from the general plane of said screen, said deformed edges extending into said frame; whereby the compression of said deformed edges of said screen by said frame causes said screen to bow away from said glass.

4,292,489

TAB HEATING AND APPLYING APPARATUS

Howard L. Gerber, Park Forest, Ill., assignor to The Continental Group, Inc., New York, N.Y.

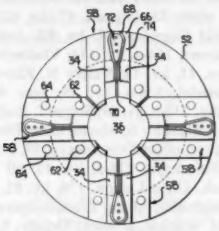
Filed Dec. 1, 1978, Ser. No. 965,679

Int. Cl.³ H05B *6/10, 6/44*

U.S. Cl. 219—10.71 **15 Claims**

1. An induction heating apparatus comprising a fixed primary coil, a circumferentially segmented secondary coil formed of a plurality of circumferentially spaced and adjacent separate segments and telescoped relative to said primary coil, means mounting said secondary coil for rotation relative to

said primary coil, and a like plurality of induction heating elements carried by said segments of said seconary coil at one



end thereof, the number of induction heating elements being equal to the number of secondary coil segments.

4,292,490

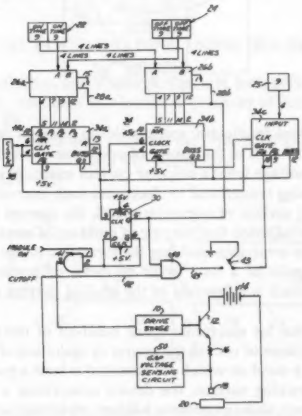
ELECTRICAL DISCHARGE MACHINING POWER SUPPLY WITH DIGITALLY CONTROLLED ON AND OFF TIME AND PROTECTIVE SYSTEM

Oliver A. Bell, Jr., Statesville; Randall C. Gilleland, Troutman, and Davey J. Chance, Concord, all of N.C., assignors to Colt Industries Operating Corp., New York, N.Y.

Continuation of Ser. No. 794,440, May 6, 1977, abandoned. This application May 7, 1979, Ser. No. 36,570

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 P **10 Claims**



1. An electrical discharge machining apparatus including an electronic output switch and a power source operatively connected to a machining gap for providing machining power pulses of digitally predetermined ON-OFF time duration thereto, and a free-running, digital type multivibrator, comprising:

a plurality of separately settable ON time and OFF time switches;

a counter stage sequentially connectable to said ON time and OFF time switches;

a data selector stage coupled intermediate said switches and said counter stage, respectively;

a high frequency pulse source directly connected to said counter stage for providing a continuous pulse train thereto for operating said counter stage;

a bistable control means having a pair of different output terminals, the first of said pair operatively connected to said data selector stage for alternately connecting said ON time and said OFF time switches to the counter stage responsive to high and low state of said first output terminal, said counter stage further operable to provide a separate enabling clock pulse to said bistable control means at the end of each count cycle of each ON time and each OFF time; and

the other of said pair connected to the control electrode of said electronic output switch for controlling its ON-OFF time operation.

4,292,491

WIRE ELECTRODE ELECTRIC DISCHARGE MACHINE WITH CONTROLLED ELECTRICAL PARAMETERS

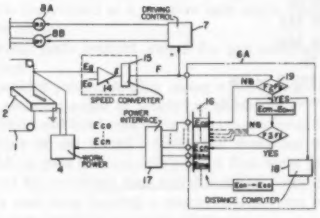
Yutaka Tanaka, and Takeshi Yatomi, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1979, Ser. No. 66,313

Claims priority, application Japan, Aug. 16, 1978, 53-99843; Nov. 2, 1978, 53-135552

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 W **12 Claims**



1. In an electric discharge machine for forming electric discharge between a wire electrode and a work piece in a work liquid by applying a voltage between said electrode and workpiece and performing a desired work by relatively moving said wire electrode and said workpiece, the improvement comprising;

means for detecting a gap voltage between said wire electrode and said workpiece;

a first comparator which compares the gap voltage detected by said detected means with the reference voltage to generate a differential signal for the difference in the voltages;

a converter which receives the output of said comparator to generate a speed signal used for a speed control of the relative movement between said wire electrode and said workpiece; and

a second comparator which compares a reference speed signal corresponding to the reference work area with the said speed signal, whereby a circuit constant of a power device for applying the voltage between said wire electrode and said workpiece is controllable and when the speed signal as the output of said converter is smaller than a predetermined speed signal, the circuit constant of said power device is controlled to increase through an electric condition control circuit depending upon the output of said second comparator; and when the work area is decreased, it is controlled to decrease the power of said power device whereas when the work area is increased, it is controlled by increase the power of said power device.

4,292,492

SEAM WELDING OF PIPES

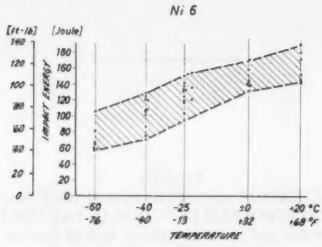
Karl Düren, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann AG, Dusseldorf, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,418

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2621182

Int. Cl.³ B23K 9/18

U.S. Cl. 219—73 2 Claims



1. In a method of longitudinally, submerged-arc, seam welding pipes made of pipe steel having up to 0.1% carbon, 2% manganese, 0.35% molybdenum and up to 0.5% nickel, using at least one welding wire having the following consistency:
up to 0.1% C
up to 0.4% Si
up to 1.5% Mn
up to 0.6% Mo
4.5 to 7.5 N:
up to 0.015% P and S
the remainder being Fe.

4,292,493

METHOD FOR DECOMPOSING OZONE

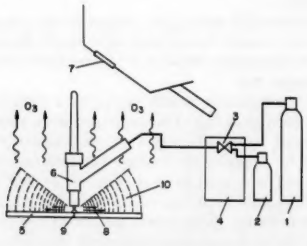
Lennart Selander, Balsta; Lars Fahlen, Vällingby, and Ladislav Sipek, Täby, all of Sweden, assignors to AGA Aktiebolag, Sweden

Continuation-in-part of Ser. No. 849,390, Nov. 7, 1977, abandoned. This application Jul. 5, 1979, Ser. No. 54,923

Claims priority, application Sweden, Nov. 5, 1976, 7612355

Int. Cl.³ B23K 9/16

U.S. Cl. 219—74 13 Claims



1. A method of decomposing ozone formed when welding or working with an electric arc, wherein a nitrogen compound is introduced into the welding or working area, said nitrogen compound being solely nitric oxide.

4,292,494

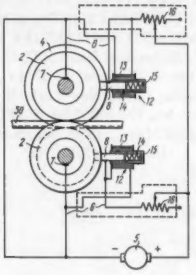
ELECTRIC SPARK BUILDING-UP OF METAL ON THE WORKING SURFACE OF ROLLS

Igor S. Trishevsky, ulitsa 23 Avgusta, 47, kv. 42; Nikolai M. Vorontsov, prospekt Gagarina, 92, kv. 82; Anatoly B. Jurchenko, ulitsa Bairona, 154-a, kv. 114; Vladimir F. Korobeinik, ulitsa Gogolya, 11, kv. 14; Valery N. Zherebtsov, prospekt Traktorostroitelei, 138-a, kv. 25; Igor A. Svistunov, prospekt Moskovsky, 238-a, kv. 49; Sergei I. Rudjuk, ulitsa 23 Avgusta, 47, kv. 63; Vladimir S. Marin, ulitsa Darvina, 16, kv. 74; Viktor N. Bruskov, ulitsa Katsarskaya, 19, kv. 8; Vitaly N. Krupenik, ulitsa Sumskaya, 124-a, kv. 13, all of Kharkov; Alexei A. Sitarchuk, ulitsa Lenina, 176, kv. 81, Zaporozhie; Alexandr D. Bondarenko, ulitsa Transvaalnaya, 15, kv. 1, Kharkov; Vadim M. Schekin, prospekt Dzjuby, 5, kv. 1, Kharkov, and Iraida A. Baldakova, ulitsa Fesenkovskaya, 16, kv. 10, Kharkov, all of U.S.S.R.

Filed Mar. 29, 1979, Ser. No. 24,974

Int. Cl.³ B23K 28/00, 9/04

U.S. Cl. 219—76.13 6 Claims



1. A method for electric spark build-up of metal on a working surface of rolls in the course of operation of a rolling mill, wherein a voltage from a unipolar current source is applied to each roll being treated and to electrodes each interacting with the working surface of a respective roll, the current and voltage being so adjusted that the rate of build-up of metal exceeds the rate of its wear, thus enabling the formation on the working surface of rolls of a limit layer of metal of predetermined thickness which is a function of the applied current and voltage.

3. A device for electronic spark build-up of metal on the working surfaces of rolls in the course of operation of a rolling mill having a stand on which are mounted at least a pair of rolls having a working surface, the device comprising a unipolar current source, sliding contacts, holders, electrodes secured in said holders for transverse movement relative to the axis of said rollers, said sliding contacts and said electrodes being connected to said unipolar current source, said sliding contacts being in contact with each roll, and each of said electrodes interacting with the working surface of each roll during operation of the rolling mill for providing electric spark treatment of the working surface of each roll, thereby maintaining the initial shape thereof.

4,292,495

WELDING TORCH WEAVING DEVICE

Takashi Saito; Katuhiko Otake, both of Kamakura, and Tokuji Maruyama, Fujisawa, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

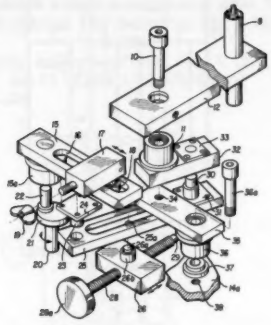
Filed Feb. 20, 1980, Ser. No. 122,853

Int. Cl.³ B23K 9/30

U.S. Cl. 219—125.12 5 Claims

1. A welding torch weaving device comprising a first link having a first elongated slot at one end thereof and pivoted to a drive source at another end to make an arc shaped movement

at said another end thereof, a first adjustably fixed shaft fitted within said first elongated slot in said first elongated slot in said first link, a second link having one end thereof pivoted on a mid portion of said first link and having a second elongated slot, a second adjustably fixed shaft fitted within said second



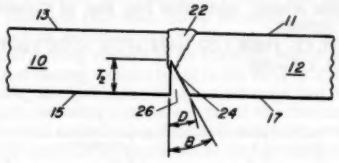
elongated slot in said second link, a third link having one end thereof pivoted on the other end of said second link, and a fourth link having one end thereof pivoted on the other end of said third link and the other end thereof pivoted on a fixed pivot shaft, wherein a weaving arm is disposed on said other end of said third link for mounting a welding torch.

4,292,496

VERTICAL PLATE WELDING USING DOUBLE BEVEL JOINT

Malcolm G. Hoy, and Walter R. Reichelt, both of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 17, 1980, Ser. No. 112,833
Int. Cl.³ B23K *9/16*
U.S. Cl. 219—126 **25 Claims**



1. A method of gas metal-arc welding of substantially vertical plates comprising:

(a) providing a first plate and a second plate with abutting edges to be welded forming a substantially vertical weld line;

(b) providing a first weld groove on one surface of the plates along the weld line formed by the abutting edges by removing plate material from the edge of only the second plate, the second plate edge including a planar root portion substantially normal to the plate surface and equal to or less than one-half the plate thickness;

(c) welding the plates together in a single upward pass by depositing a weld bead in the first weld groove to completely fill said groove;

(d) thereafter, providing a second weld groove on the opposite surface of the welded plates by removing plate material substantially from the abutting edge of only said second plate to a depth extending at least to the weld bead deposited in the first weld groove on the opposite surface of the plates; and thereafter

(e) welding the plates together in a single upward pass by depositing a weld bead in the second weld groove to completely fill said second groove;

(f) said welding steps include impressing a direct current of 290 to 420 amperes between an electrode of a welding torch and said plates with the electric arc formed thereby shielded primarily by argon gas, the torch maintaining a positive lead angle relative to the plate surface.

19. A welded joint made by gas metal-arc welding for joining base metal plates comprising:

(a) a joining line lying in a substantially vertical plane formed between abutting edges of welded plates;

(b) a first narrow and deep weld bead extending along said joining line on one surface of the joined base metal plates deposited in a single welding pass to completely fill a first weld groove prepared by removing base metal material from the edge of only one plate leaving a planar root portion equal to or less than one-half the plate thickness;

(c) a second narrow and deep weld bead on the opposite surface of the joined articles and deposited in a single welding pass to completely fill a second weld groove formed by removing base metal material substantially from the same plate as for said first weld groove along a line coextensive with said joining line of said first weld bead and to a depth at least extending to said first weld bead penetrating from the opposite surface of the joined articles;

(d) said first and second weld beads forming a generally K-shaped welded joint having a total weld bead thickness up to twice as great as the bead width; and

(e) said weld beads deposited in said grooves by a welding torch maintained at a positive lead angle relative to the plate surface.

23. Metal plate articles joined by gas metal-arc welding comprising:

(a) a welded joint extending along a joining line formed by the abutting edges of welded articles;

(b) a first weld bead extending along said joining line on one surface of the joined articles and deposited by a single welding pass to completely fill a first weld groove prepared by removing base metal material from the edge of only one plate leaving a planar root portion equal to or less than one-half the plate thickness;

(c) a second weld bead on the article surface opposite said first weld bead and deposited by a single welding pass to completely fill a second weld groove formed by removing base material substantially from the same metal plate as for said first weld groove along a line coextensive with said joining line of said first weld bead and to a depth at least extending to said first weld bead penetration from the opposite surface of the joined articles;

(d) said first and second weld beads forming a generally K-shaped welded joint having a total weld bead thickness up to twice as great as the bead width; and

(e) said weld beads deposited in said grooves by a welding torch maintained at a positive lead angle relative to the plate surface.

4,292,497

PULSED ARC WELDING AND SURFACING APPARATUS

Boris E. Paton, ulitsa Chkalova, 41a, kv. 26; Vladimir K. Lebedev, ulitsa Engelsa, 25, kv. 12; Pavel P. Sheiko, prospekt Nauki, 19/3, kv. 16, and Mikhail P. Pashulya, ulitsa Konstantinovskaya, 61, kv. 11, all of Kiev, U.S.S.R.

Filed Feb. 1, 1979, Ser. No. 8,561
Int. Cl.³ B23K *9/09*
U.S. Cl. 219—130.51 **8 Claims**

1. A pulsed arc welding and surfacing apparatus comprising a power circuit including

an article to be welded;

a single-phase output voltage regulated leakage transformer having a primary winding connected to a power supply, and a secondary winding;

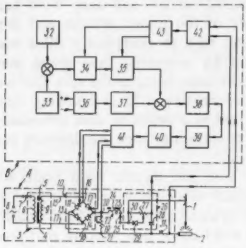
a controlled bridge rectifier electrically connected to the

secondary winding of said transformer, said controlled bridge rectifier having controlled rectifiers, a positive output and a negative output electrically connected to said article to be welded;

an induction coil having a variable non-linear inductance connected to the positive output of said controlled bridge rectifier;

a variable resistor connected to said positive and negative outputs of said controlled bridge rectifier, said variable resistor varying the output voltage of said apparatus during no-load running thereof;

an integrator including a variable resistor having a first lead electrically connected to said induction coil, said variable resistor of said integrator having a second lead and a movable electrode for varying the output thereof, a capacitor connected to the second lead of said variable resistor of said integrator and to the negative output of said controlled bridge rectifier, and a diode electrically connected between the movable electrode of said variable resistor of said integrator and said induction coil thereby shunting a section of said variable resistor between said movable electrode and said first lead of said variable resistor, said diode being connected with a polarity preventing the passage therethrough of the charging current of said capacitor; and



a power circuit control unit acting upon the power circuit to permit the welding arc to be fed a current the variation of which in time can be represented in the form of a sum curve of a direct current component and a periodic curve, said sum curve having its leading edge rising approximately linearly and its trailing edge falling approximately exponentially, said power circuit control unit being electrically connected to said controlled bridge rectifier.

4,292,498

HIGH VOLTAGE ELECTRODE STEAM BOILER AND ELECTRODE ASSEMBLY THEREFOR

Mohammad A. Rouf, Kewanee, Ill., assignor to Kewanee Boiler Corporation, Kewanee, Ill.

Filed Sep. 7, 1979, Ser. No. 73,282

Int. Cl.[3] **H05B** *3/60;* **F22B** *1/30*

U.S. Cl. 219—288 **22 Claims**

1. An electrode boiler comprising

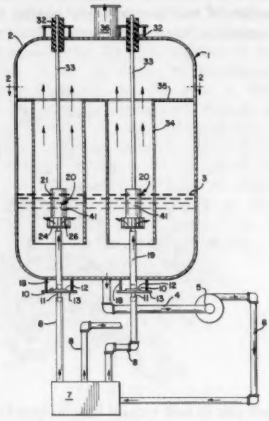
boiler means for receiving a quantity of electrically conductive fluid,

an electrode positioned within said boiler means and adapted to be coupled to a source of electrical potential for directing electrical current through the quantity of fluid to raise the temperature thereof,

said electrode having an internal flow passage and an outer peripheral surface, said flow passage being provided with outlet means in said peripheral surface,

fluid supply means coupled to said internal flow passage for supplying fluid under pressure to said internal flow passage, and

said electrode further including fluid guide means arranged with respect to said peripheral surface of said electrode in the path of fluid exiting from said outlet means for causing fluid circulation adjacent said outer peripheral surface of the electrode to remove steam bubbles therefrom during



the heating of the quantity of fluid within said boiler means.

4,292,499

ELECTRONIC CALCIFICATION INDICATOR FOR FLOW HEATERS HEATED BY PTC RESISTORS

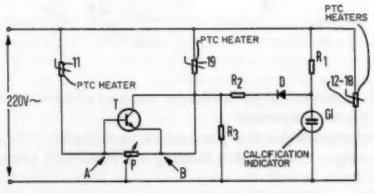
Peter Kleinschmidt, Munich; Hans Meixner, Haar, and Valentin Magori, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,691

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 2839062

Int. Cl.[3] **H05B** *1/02;* **A47J** *31/56, 31/88;* **F24H** *1/10*

U.S. Cl. 219—308 **6 Claims**



1. An electronic calcification indicator for a flow heater for determining a change of condition which arises in the flow heater because of increasing calcification, comprising: a flow heater heated by separate PTC resistors forming heating elements; one of said PTC resistors being provided at least at a region of water entry and at a region of water exit with each having a separate current supply line; an electrically operated display device operative by a signal; and circuit means connected to the display device for determining when a relative current difference in the current supply lines of the entry and exit region PTC resistors with respect to one another exceeds a predetermined amount so as to create a signal for activating the display device indicative of increased calcification of the exit PTC resistor element relative to the entry element.

4,292,500
MODULAR, CONSTRUCTIONAL HEATING UNIT

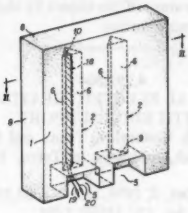
Daniel Semanaz, Vernaison, and Robert Cassat, Ternay, both of France, assignors to Rhone-Poulenc Industries, Paris, France

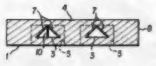
Continuation-in-part of Ser. No. 914,922, Jun. 12, 1978, abandoned, and a continuation-in-part of Ser. No. 828,603, Aug. 29, 1977, abandoned, which is a continuation of Ser. No. 813,353, Jul. 6, 1977, abandoned. This application Sep. 7, 1978, Ser. No. 940,364

Claims priority, application France, Sep. 7, 1977, 77 27676

Int. Cl.³ F24H *9/02*; H05B *3/02*

U.S. Cl. 219—345 **31 Claims**





1. A modular, constructional heating unit, which can be used for producing heating partitions by juxtaposition, said heating unit consisting essentially of a plaster based solid panel formed of at least one member; said panel having opposing, essentially parallel front and back face surfaces and a plurality of edge surfaces, and being provided with at least one internal, elongate, continuously rectilinear cavity, each such cavity being internally shaped into solid panel between the front and back face surfaces thereof, the longitudinal axis of each such cavity being parallel to the face surfaces of the panel, each such cavity being exteriorly communicating through said panel at one of its ends, and each such cavity containing in the free space thereof an electrical heating element and means for coupling said heating element to an electrical power source, said electrical heating element being in the form of a flexible strip including an electrical wire embedded more than 50% in an electrically insulating material comprised of a macromolecular material and a reinforcing filler, said strip being arranged along a plane generally perpendicular to the face surface of the panel.

4,292,501
PYROLYTIC OVEN WITH A VARIABLE HEATING SPEED

Paul Maitenaz, Olivet, France, assignor to Compagnie Europeenne pour l'Equipement Menager "CEPEM", Paris, France

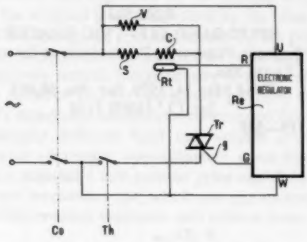
Filed May 11, 1978, Ser. No. 904,967

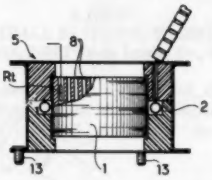
Claims priority, application France, May 16, 1977, 77 14895

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—413 **4 Claims**

1. A pyrolytically cleaned domestic cooking oven including: an oven compartment, heating elements for heating the oven during cooking and pyrolytic cleaning, a catalyst for combustion of smoke given off during pyrolytic cleaning, said catalyst formed by a block pierced with a plurality of ducts which pass through said block to allow the smoke to pass over a large contact surface of said block, a temperature sensor positioned inside the body of the catalyst in one of said ducts to generate a temperature signal to regulate the heating control of the oven during pyrolytic cleaning, an electronic control connected in series with the oven heating elements, an electronic regulator connected to said temperature sensor to control said electronic control, a thermostat placed in series with the electronic control in order to regulate the maximum temperature of pyrolytic cleaning, and wherein said catalyst includes a heating resistor





and said temperature sensor is placed in a position where it is protected from the direct influence of said catalyst heating resistor.

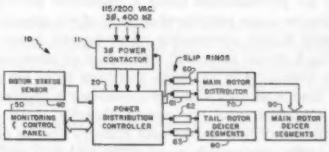
4,292,502
HELICOPTER DEICER CONTROL SYSTEM

Lowell J. Adams, Tallmadge, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Feb. 5, 1979, Ser. No. 9,636

Int. Cl.³ H05B *3/02*

U.S. Cl. 219—483 **17 Claims**



1. A device for selectively distributing electrical power to a plurality of load elements on at least one rotating member comprising:

a source of electrical power;

controller means connected to said source of electrical power and providing an output signal having an electrical parameter variable between at least two distinguishable states, a first control state for selecting which of the load elements is to next receive power and a second power state for distributing electrical power to whichever load element is selected; and,

distributor means rotating with the rotating member for receiving said output signal from said controller means, said distributor means switching upon receipt of said

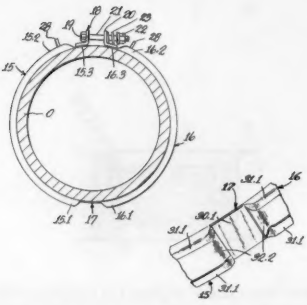
output signal in said first control state to the load element to next receive power, and distributing electrical power only upon receipt of said output signal in said second power state to whichever load element is selected.

4,292,503

SPLIT-BAND ELECTRIC HEATER

Richard W. Brent, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 14, 1979, Ser. No. 38,402
Int. Cl.³ H05B 3/58
U.S. Cl. 219—535 **4 Claims**



2. In a split band heater adapted to encompass the outer periphery of a cylindrical object for heating the same, said heater having disconnectable tensioning means at the split thereof, said tensioning means when connected and tensioned being adapted to draw said split-band heater tightly around and against a transverse outer peripheral surface of the object, the improvement wherein said split-band heater comprises:

at least two arcuately-shaped metal-sheathed strip heaters, each for positionment along a respective portion of the transverse outer peripheral surface of the object,

each strip heater comprising an elongated metal channel having a planar base wall and a pair of coextensive side walls extending in the same direction from the edges of said base wall, said channel containing a resistance wire and electrical insulation means therefor, both disposed lengthwise of and within said channel and an elongated metal strip substantially equal to the length of said channel and fitting transversely within said channel and in spanning relation with respect to said side walls, the latter being bent over adjoining longitudinal margins of said strip to lock said resistance wire and insulation means within said channel,

each strip heater being arcuately bent so that its base wall is curved and located innermost of the arc so as to be adapted to closely fit along and against the curved transverse outer surface of the cylindrical object,

said strip heaters being arranged in spaced-apart, end-to-end relationship as longitudinal continuations to transversely fit along a substantial portion of the outer peripheral surface of the cylindrical object, a juxtaposed pair of spaced strip heater ends defining said split and said tensioning means being connected thereto, the remaining juxtaposed pairs of spaced ends each being connected together by a flexible metal band which forms a structurally integral continuation of the base walls of the so-connected strip heaters so as to also lie close to the juxtaposed outer surface of the cylindrical object without any substantial space between,

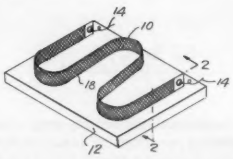
the flexibility of the band enabling said strip heaters to be moved apart, when said tensioning means are disconnected to open said split enough so that the heaters may be moved in a direction transverse to the longitudinal axis of the object to a position around the object, and the flexibility of the band further permitting the base walls of said strip heaters to be drawn against the transverse peripheral wall of the object to closely conform said walls and the band to the curvature of the object by the connected and tensioned tensioning means.

4,292,504

EXPANDED METAL ELECTRIC HEATING ELEMENT WITH EDGE SUPPORT

Peter D. Gebarowski, Cookeville, Tenn., and Sam W. Henry, North Ogden, Utah, assignors to Tutco, Inc., Cookeville, Tenn.

Filed Oct. 2, 1979, Ser. No. 81,256
Int. Cl.³ H05B 3/06
U.S. Cl. 219—542 **11 Claims**



1. An electric resistance heating unit, comprising: a support board of ceramic fiber insulating material having a continuous groove on the surface, a thin apertured expanded strip of foil-like electric resistance material wherein said strip has one of its edges embedded in said groove and is substantially perpendicular to the surface of said support board, means supporting said strip of foil-like material on edge along substantially its entire length on said support board comprising: cement distributed at least semi-continuously along said strip to fasten the edge of the strip in the support board, and terminals conductively connected to said thin strip of foil-like electric resistance material, said terminals being insulatedly passed through said support board.

4,292,505

FURNACE FOR GENERATING HEAT BY ELECTRICAL RESISTANCE

Jeoung K. Lee, 6231 Fuji Tou, Fuji Tsawa-City, Kanakawa-Ken, Japan

Filed Sep. 19, 1979, Ser. No. 76,849
Claims priority, application Philippines, May 9, 1979, 22468
Int. Cl.³ H05B 3/10
U.S. Cl. 219—553 **1 Claim**

1. A controlled electrically resistant heat generating furnace comprising:

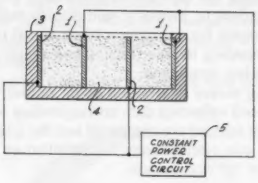
a furnace body;

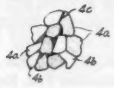
a plurality of electrodes secured in and to oppose each other within said furnace body;

a plurality of heat generating elements disposed between said electrodes; and

constant power control circuit means for supplying an electric current across said electrodes;

said heat generating elements comprising a substantially homogencous mixture of carbonized plant particles, non-





organic particles and a carbonized binder, the amount by weight of said carbonized plant particles in said mixture being greater than the amount by weight of said non-organic particles, and said non-organic particles being electrical insulators below a predetermined temperature and being conductors or semiconductors above said predetermined temperature.

4,292,506

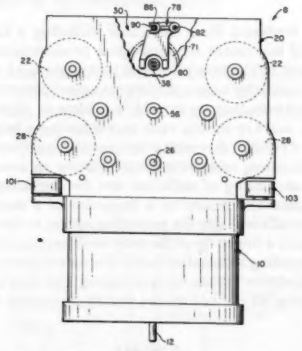
FUEL PUMP COMPUTER PRICE VARIATOR

Raymond H. Devanney, Winsted, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed May 4, 1979, Ser. No. 35,991

Int. Cl.³ B67D *5/22*; F16H *3/22*; G06C *15/04*

U.S. Cl. 235—61 L **6 Claims**



1. In a fuel delivery pump computer mechanism having a drive shaft connected to be driven in accordance with the volume amount of fuel delivered, a price selector mechanism driven by the drive shaft and selectively settable for selectively establishing an adjustable unit volume price within a predetermined price range with a predetermined maximum unit volume price of at least 99 and 9/10 cents and having a rotary cost output driven in accordance with the volume amount of fuel delivered and the selected unit volume price established by the setting of the price selector mechanism, and a register having a volume counter connected to be driven by the drive shaft for registering the volume amount of fuel delivered and a cost counter for registering the cost amount of fuel delivered, the computer mechanism having a price adder mechanism in the register for establishing a unit volume price adder to the selected unit volume price of the price selector mechanism and connected for driving the cost counter for registering the cost amount of fuel delivered in accordance with the volume amount delivered and registered by the volume counter and the sum of the selected price established by the price selector mechanism and the price adder established by the price adder mechanism, the improvement wherein the price adder mechanism is selectively settable independently of the price selector mechanism to either of two operational positions thereof to alternatively selectively establish predetermined first and second substantially different fixed unit volume price adders which provide successive approximately equal fixed increments to the adjustable unit volume price established by the price selector mechanism and which are approximately one-half said predetermined maximum unit volume price.

4,292,507

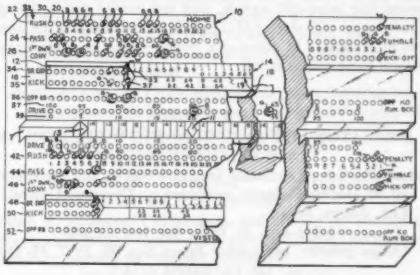
FOOTBALL STATISTIC PEGBOARD

J. Warren Hovorka, 10102 Verde Lomas Dr., Villa Park, Calif. 92667

Continuation-in-part of Ser. No. 736,368, Oct. 28, 1976, abandoned. This application Mar. 9, 1978, Ser. No. 884,762

Int. Cl.³ A63F *1/18*

U.S. Cl. 235—90 **25 Claims**



1. A recording device useful for calculating and recording play statistics during a football game which comprises:

a body bearing at least two longitudinal grooves;

a slide movably carried on said body and in at least one of said grooves;

a scale calibrated in indicia of arithmetic progression coextensive with said slide;

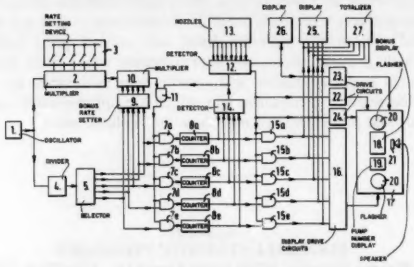
removable marker means, each bearing an indicum of a single class of a plurality of distinct classes of indicia identifying said marker as pass complete, pass incomplete, pass intercepted, and rushing play; and

first and second sets of first, second, and third parallel rows of a plurality on receiver means on said body one set each associated with one of said grooves and associated therewith, indica identifying one each of said rows with a respective indicum of passing, rushing, and first down statistics, said plurality of receiver means being located in equal arithmetic spacing to the spacing of said indicia on said slide forming a plurality of aligned lateral columns of receiver means, one column for each of the plays by the team in possession during the recording interval of a football game and receiving said removable marker means to record passing, rushing, and first down statistical information.

4,292,508
TRADING SYSTEM

Kenneth N. Rudd, 23, Kings Walk, Shoreham by Sea, Sussex, England

Filed Jun. 13, 1979, Ser. No. 48,315
Claims priority, application United Kingdom, Jun. 14, 1978, 26959/78
Int. Cl.³ G06M *3/02*
U.S. Cl. 235—92 GA **11 Claims**

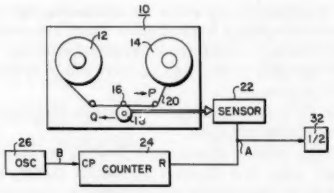


1. Apparatus for use in a trading system to determine the allocation of bonuses to customers, comprising means for continuously generating input signals at a fixed rate proportional to time, a plurality of store means, distribution means coupled to said signal generating means for distributing said input signals to said plurality of store means, and means coupled to said store means for receiving from said store means respective store-full signals, said last-named means being responsive to said store-full signals for conditioning the apparatus in readiness to allocate a bonus which is determined by which store means is full.

4,292,509
INDICATOR FOR TAPE RUNNING DIRECTION AND TAPE REMNANT AMOUNT

Masanobu Sato; Ken Satoh; Toshihiro Nakao, and Kenzi Furuta, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1978, Ser. No. 936,688
Claims priority, application Japan, Sep. 30, 1977, 52/117561
Int. Cl.³ G06M *3/14*
U.S. Cl. 235—92 MP **17 Claims**



1. An indicator for tape running direction and tape remnant amount comprising:

a tape transport;

display means in which a plurality of digit display sections including display elements are arranged side by side;

sensing means coupled to said tape transport for providing a sensing signal corresponding to the rotation of a tape reel;

running indication signal generating means operatively connected to said sensing means for sequentially generating running indication signals corresponding to a tape running direction on the basis of the sensing signal;

gate circuit means in which at least one running indication signal corresponding to the amount of tape remnant is selected and, upon the selection, tape running direction/-tape remnant amount indication signals are sequentially produced;

drive means for driving at least one display element for each digit display section in accordance with the tape running direction/tape remnant amount indication signals in order to indicate the tape running direction and the tape remnant amount by means of said display means;

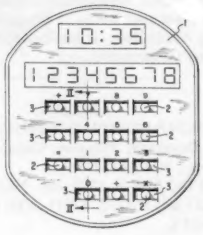
counter means for counting a clock signal to make a count corresponding to tape running and adapted to be reset by the sensing signal; and

comparing means in which a count output of said counter means and reference data corresponding to the fixed tape remnant amount are compared and the selection operation of said gate circuit means is controlled on the basis of the result of the comparison.

4,292,510
KEYBOARD FOR A MINIATURE CALCULATOR

Manfred Hild, Staibenäcker 24, D-7000, Stuttgart 1, Fed. Rep. of Germany

Filed Mar. 15, 1979, Ser. No. 20,725
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1978, 2813234; Sep. 23, 1978, 2841463
Int. Cl.³ G06C *7/02*
U.S. Cl. 235—145 R **12 Claims**



1. In a keyboard for a calculator including a face plate, a plurality of key means supported in a predetermined location with respect to the face plate and being arranged to be selectively accessible by a user; the improvement comprising means defining narrow recesses in said face plate in alignment with respective said key means; each recess having a length dimension and a width dimension measured transversely to the length dimension; said dimensions defining an area of the recess; said area being of sufficient size for providing access to the associated key means by a fingernail of a user; said area being of insufficient size for providing access to the associated key means by a finger tip of the user; each key means having an outline extending substantially over the entire width dimension of the respective recess for preventing the user's fingernail from slipping off the key means during depression thereof.

4,292,511
APPARATUS AND METHOD FOR READING AN IDENTIFYING LABEL ON AN INFORMATION RECORD

Philip M. Heyman, Robbinsville, and David P. Bortfeld, Kendall Park, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,133
Int. Cl.³ G06K *7/00*
U.S. Cl. 235—454 **9 Claims**

1. Apparatus for reading an identifying label on an information record, wherein the label comprises an annular area of the surface of the information record having first surface regions which have a circular surface effect for scattering light in a first direction and second surface regions which have a circular surface effect for scattering light substantially away from

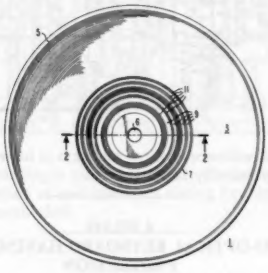
the first direction wherein the arrangement of the first surface regions with respect to the arrangement of the second surface regions is representative of the identity of the information signal stored in the annular area, which apparatus comprises:

a light source;

a collimating optical system for collecting and partially collimating a light beam emitted by the light source for illumination of a radial portion of the annular area;

means for positioning the information record to receive and scatter the light beam;

a focusing optical system for collecting that portion of the



light beam scattered in a first direction from the annular area and focusing the collected light beam onto a light sensitive detector;

a light sensitive detector having a multiplicity of light sensitive elements and positioned for simultaneously detecting light scattered from the area of the information record having the label thereon wherein light scattered from successive regions of the label are focused on successive elements of the light detector and detected therein; and

electrical means whereby the detected light is converted into a serial electrical signal representative of the identifying label on the information record.

4,292,512

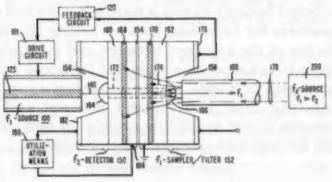
OPTICAL MONITORING PHOTODIODE SYSTEM

Richard C. Miller, Summit, and Bertram Schwartz, Westfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 19, 1978, Ser. No. 916,501

Int. Cl.[2] G01J *1/32*

U.S. Cl. 250—205 **4 Claims**



1. A monitoring system comprising:

a source of optical radiation,

feedback means for sensing the intensity of a portion of said radiation and for generating an electrical signal proportional thereto,

control means for controlling the intensity of radiation from said source in response to said electrical signal, and

utilization means for receiving said radiation, characterized in that, said feedback means comprises a double heterostructure photodiode which includes:

a pair of wide bandgap semiconductor layers transparent to said radiation,

a light-absorbing semiconductor active layer interposed between and contiguous with said wide bandgap layers and oriented to intercept said radiation,

said active layer having a bandgap and thickness which are mutually adapted to absorb only a small portion of said radiation and to transmit therethrough a major portion of said radiation to said utilization means, said utilization means including an optical fiber positioned to receive said radiation transmitted through said active layer, and

a p-n junction in said active layer for collecting photocarriers generated by the absorption of said radiation in said active layer, thereby to produce in said photodiode a photocurrent which is essentially linearly proportional to the intensity of said radiation, said photocurrent constituting said electrical signal to which said control means is responsive, further characterized in that said system includes

a first transceiver station including said source (f_1-source) for transmitting said beam of optical frequency f_1 (f_1-beam) over said fiber,

a remote transceiver station for receiving said f_1-beam and including another optical source (f_2-source) for transmitting a beam of optical frequency f_2 (f_2-beam), $f_1 > f_2$, over said fiber to said first station,

said first station including

said double heterostructure photodiode (f_1-PD) disposed between said f_1-source and said fiber,

a second double heterostructure photodiode (f_2-PD) disposed between said f_1-source and said f_1-PD and including an active layer having a thickness and bandgap adapted to absorb substantially all of said f_2-beam incident thereon, thereby generating a photocurrent in response to the absorption of said f_2-beam, and

second utilization means to which said photocurrent of said f_2-PD is applied,

said f_2-PD having a light transparent path extending transversely therethrough to prevent substantial absorption of said f_1-beam by said active layer of said f_2-PD.

4,292,513

HEAT DETECTOR CIRCUIT

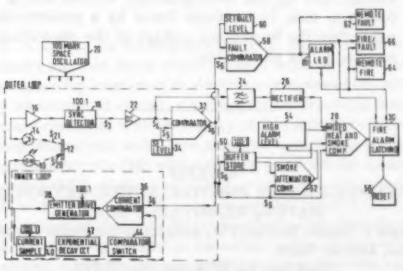
Richard R. Simmons, Twickenham, and Harvey A. Thompson, Weybridge, both of England, assignors to Chubb Fire Security Limited, Sunbury on Thames, England

Filed Oct. 1, 1979, Ser. No. 80,716

Claims priority, application United Kingdom, Sep. 29, 1978, 38757/78

Int. Cl.[3] G01N *21/28*

U.S. Cl. 250—205 **11 Claims**



1. Heat detection apparatus comprising a light emitter, a light detector for receiving light from the emitter, and an alarm circuit responsive to variations in the output of the detector due to variations in the optical coupling between the emitter and detector, and further comprising an automatic gain control circuit having a time constant such that it does not react to the

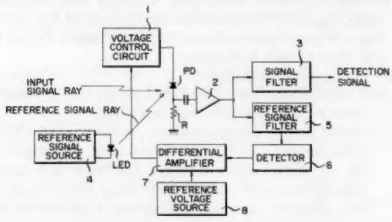
thermal turbulence to which the apparatus is designed to respond, the automatic gain control circuit including an emitter control circuit which is responsive to a variation in the amplitude of the signal derived from the light detector from a preset amplitude and which is such that the said variation results in an exponential increase in the driving signal for the light emitter.

4,292,514

APPARATUS FOR, AND METHOD FOR, ACHIEVING A TEMPERATURE COMPENSATION OF AN AVALANCHE PHOTODIODE

Fumio Ohtomo, Kawagoe, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1979, Ser. No. 94,555
Claims priority, application Japan, Nov. 20, 1978, 53-142208
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 C **4 Claims**



1. An apparatus for achieving temperature compensation of an avalanche photodiode, comprising:

a voltage-generating circuit for applying bias voltage to the avalanche photodiode;

controlling means for controlling output voltage of said voltage-generating circuit; and

holding means for holding bias voltage which is applied to the photodiode when the breakdown of the avalanche photodiode occurs,

in which said controlling means causes said voltage-generating circuit to deliver the bias voltage for causing breakdown in the photodiode immediately before the photodiode is operated, and causes said voltage-generating circuit to deliver bias voltage, when said photodiode is operated, which is lower by a predetermined value than said bias voltage held by said holding means, so that, during the operation time, bias voltage lower by a predetermined value than the breakdown voltage of the photodiode is supplied to the photodiode.

4,292,515

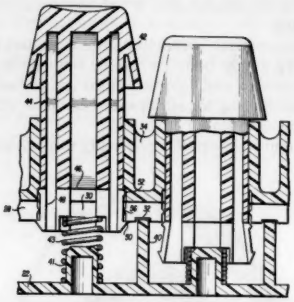
RECONFIGURABLE PHOTO-ELECTRIC KEYBOARD HAVING REMOVABLE KEYS

Edward I. Nelson, Sunrise, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 14, 1979, Ser. No. 75,370
Int. Cl.³ G01D *5/34*
U.S. Cl. 250—229 **6 Claims**

1. A photo-optical keyboard having apertures for keys comprising:

a key having a keystem with sidewalls shaped to said apertures, at least one of said sidewalls having at least one flexible portion with a retainer flange thereon, said retainer flange serves as a stop restricting the upward motion of said key in said aperture said flexible portion having the resilience to allow said keys to be withdrawn from said aperture by hand pressure.

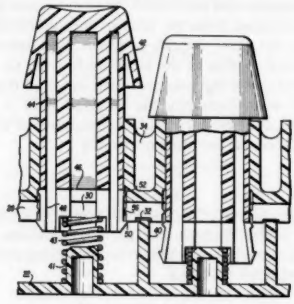


4,292,516

PHOTO-OPTICAL KEYBOARD HAVING DEBRIS PROTECTION

Edward I. Nelson, Sunrise, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 14, 1979, Ser. No. 75,394
Int. Cl.³ G01D *5/34*
U.S. Cl. 250—229 **6 Claims**



1. A photo-optical keyboard comprising:

a keyboard housing having a matrix of rows and columns of apertures for keys, said housing having recesses open to the top of the keyboard between said apertures; and

multiple keys for positioning in said keyboard housing apertures, said keys each having an umbrella cap with edges extending over said recesses between said apertures, whereby liquid and debris spilling on said umbrella cap will fall into said recesses to be contained.

4,292,517

PHOTO-OPTICAL KEYBOARD PROVIDING TACTILE FEEL

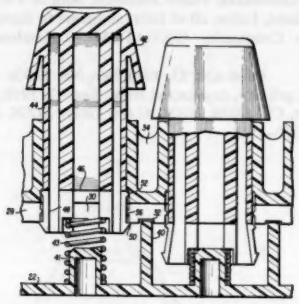
Edward I. Nelson, Sunrise, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 14, 1979, Ser. No. 75,395
Int. Cl.³ G01D *5/34*
U.S. Cl. 250—229 **5 Claims**

1. A photo-optical keyboard comprising:

a keyboard housing having a matrix of rows and columns of apertures for keys, each said aperture having at least one ridges on the inside surface of said apertures; and

multiple keys each shaped to said apertures, each said key further having at least one flexible finger on its side walls said flexible finger having ridges thereon, the ridges on



said flexible finger making contact with the ridges on the inside surface of said apertures during key depression to provide tactile feel.

4,292,518

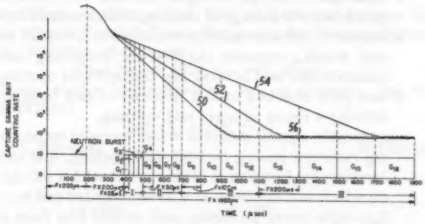
METHODS AND APPARATUS FOR MEASURING THERMAL NEUTRON DECAY CHARACTERISTICS OF EARTH FORMATIONS

Charles W. Johnstone, Houston, Tex., assignor to Schlumberger Technology Corp., Houston, Tex.

Division of Ser. No. 955,176, Oct. 26, 1978, Pat. No. 4,224,516. This application Apr. 24, 1980, Ser. No. 143,416

Int. Cl.³ G01V *5/00*

U.S. Cl. 250—262 **10 Claims**



1. A method for measuring a thermal neutron decay characteristic of an earth formation, comprising the steps of:

(a) irradiating a formation with a plurality of discrete bursts of fast neutrons;

(b) selecting, as a function of a known value of the thermal neutron decay characteristic of the formation to be measured, a certain set of two different measurement intervals following each neutron burst from among a number of such sets of two measurement intervals, each of such sets of measurement intervals corresponding to a particular range of values of said decay characteristic, said certain set of measurement intervals selected being that set which corresponds to the decay characteristic value range which encompasses said known value of the decay characteristic;

(c) measuring indications of the thermal neutron concentration in the formation during each of said measurement intervals in said selected set following each neutron burst;

(d) measuring indications of background radiation during a third measurement interval following each neutron burst;

(e) forming a background-compensation measurement from the background measurements made in step (d) accumulated over two or more pluralities of said plurality of neutron bursts;

(f) combining said background-compensation measurement with the neutron-concentration measurements of step (c) accumulated over said plurality of neutron bursts to form background-compensated neutron-concentration measurements;

(g) forming a ratio R of the background-compensated measurements made in step (f);

(h) determining a new value of said decay characteristic as a function of the value of the ratio R formed in step (g); and

(i) repeating steps (a) through (h) using the new value of the decay characteristic determined in step (h) above as the known value of the decay characteristic in new step (b).

4,292,519

DEVICE FOR CONTACT-FREE POTENTIAL MEASUREMENTS

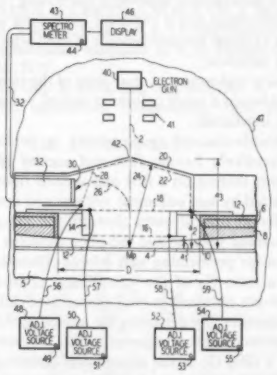
Hans P. Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 29, 1979, Ser. No. 98,645

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1979, 2902495

Int. Cl.³ H01J *37/26*

U.S. Cl. 250—310 **3 Claims**

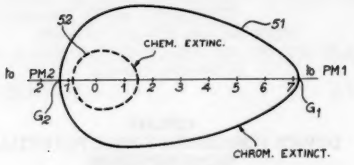


1. A device for contact-free potential measurement with a primary electron beam which releases secondary electrons at the measuring location of an electronic component (4), preferably an integrated circuit, a scintillator for receiving said secondary electrons, with the energy of said secondary electrons being determined with a spectrometer comprising, a first extraction electrode (16) with a spacing (a_1) from the measuring location (MP) of the component, a retarding field electrode (18) with a spacing (a_2) from the measuring location (MP), said first extraction electrode (16) and said retarding field electrode (18) substantially parallel to the surface of said component (4), a second extraction electrode (28) mounted between said retarding field electrode (18) and said scintillator (30), and said second extraction electrode (28) mounted at an angle which is greater than 0° relative to said retarding field electrode (18), said primary electron beam (2) impinging substantially normal to the surface of said component (4), and said first and second extraction electrodes and said retarding field electrode formed as grids.

4,292,520
LIQUID SCINTILLATION SPECTROMETRY PROCESS AND APPARATUS

Pierre Jordan, Carmenstr. 41, CH-8032 Zurich, Switzerland

Continuation-in-part of Ser. No. 54,907, Jul. 5, 1979, abandoned.
This application Sep. 4, 1979, Ser. No. 71,867
Int. Cl.[3] G01T *1/00;* B01T *1/20*
U.S. Cl. 250—328 12 Claims



1. A liquid scintillation spectrometry process for samples having a fluorescence efficiency quenching comprising a chromatic quenching and a chemical quenching wherein:

(a) an external standard source is used which emits an ionizing radiation;

(b) using said source, a small area of the sample cross-section and hence a small columnar partial volume of the sample are irradiated;

(c) double-channel spectrometry is performed by means respectively having first and second photodetectors as inputs thereof on a first and second fluorescent radiation emitted by said columnar volume and respectively having different optical paths through the sample between said columnar volume and the photodetector in each case and then for performing said double-channel spectrometry:

(i) a ratio G_1 of the scintillation counting rates respectively obtained in two channels of different energies is measured by detecting the scintillations by a first of said photodetectors exposed to the first radiation;

(ii) a ratio G_2 of the scintillation counting levels obtained in two channels of different energies is measured by detecting the said scintillations by a second of said photodetectors exposed to the second radiation;

(iii) ratio G_1/G_2 is measured and this gives a parameter B;

(d) a parameter G_s is measured which is equal to the ratio of the scintillation counting rates obtained in two channels of different energies by measuring the sum of the scintillations simultaneously detected by the first and the second photodetectors;

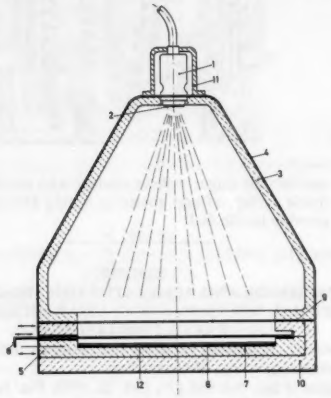
(e) calibrations are carried out by the foregoing steps (b), (c) and (d) using standard solutions having predetermined chromatic and chemical quenching proportions as samples and a graphically displayable correspondence is established between parameters B and G_s, the chemical/-chromatic quenching proportions and the fluorescence efficiency;

(f) the fluorescence efficiency of the another sample of unknown proportion of chromatic to chemical quenching is then deduced from said calibration and from the values of B and G_s obtained by analysis of said sample.

4,292,521
RADIOGRAPHIC DEVICE AND METHOD FOR RECOVERING INFORMATION FROM OVER-EXPOSED RADIOGRAPHS

Fernand Luchtmans; Pierre Jehenson, both of Varese, and Angelo Pisoni, Luino, all of Italy, assignors to European Atomic Energy Community (EURATOM), Luxembourg, Luxembourg

Filed Apr. 13, 1979, Ser. No. 29,936
Claims priority, application Italy, Apr. 17, 1978, 48929 A/78
Int. Cl.[3] G03B *27/04, 41/16;* G01N *21/00, 23/00*
U.S. Cl. 250—323 8 Claims



1. A radiographic device for use in deriving information from an over-exposed region of a first film, comprising:

a light-tight housing, having a first end with an opening permitting the passage of ionizing radiation therethrough,

a source of ionizing radiation mounted to a second end of said housing opposite the first for projecting ionizing radiation into said housing and through said opening,

a base plate attached to said first end of said housing and defining a recess adjacent said opening,

a removable cassette mounted in said recess to receive ionizing radiation passing through said opening, said cassette carrying the first film in close contact with a second film on which said information is to be recorded and having a light-tight cover protecting said second film from exposure which is displaceable to permit exposure of said second film to an image produced by irradiation of the first film by the source, and

a layer of lead covering the exterior of said housing and base plate.

4,292,522
MATERIAL DENSITY RADIOLOGICAL MEASUREMENT SYSTEM WITH SUBSTANTIALLY LINEAR OUTPUT

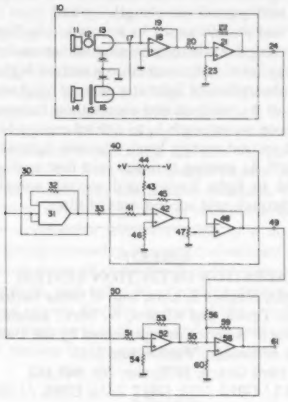
Yutaka Okumoto, Tokyo, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Dec. 14, 1979, Ser. No. 103,860
Claims priority, application Japan, Dec. 20, 1978, 53-156353
Int. Cl.[3] G01N *23/00;* A24C *5/32*
U.S. Cl. 250—358 R 3 Claims

1. A material density radiological measurement system comprising a material density radiological detector having a radiation souce for density measurement, an ionization chamber for density measurement, and a means for generating a reference density signal, said detector producing an output signal from a difference of an output signal of said ionization chamber for density measurement and said reference density signal;

a squaring circuit connected to the output terminal of said detector;

a constant multiplying circuit connected to the output terminal of said squaring circuit, said constant being predetermined to have a value which is smaller than the reciprocal



of an ionization current obtained when the density of a material to be measured is equal to the reference density; and

a subtracting circuit, which input terminals being connected to the output terminals of said detector and said constant multiplying circuit, respectively.

4,292,523

SPECIMEN ADJUSTMENT METHOD AND SYSTEM FOR A CORPUSCULAR BEAM APPARATUS

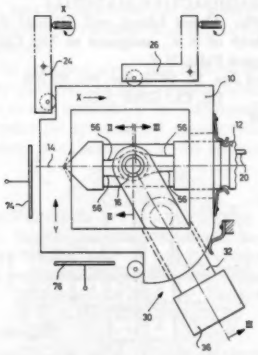
Walter Hoppe, Lochham, Fed. Rep. of Germany, assignor to Max-Planck-Gesellshaft zur Forderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Jun. 5, 1979, Ser. No. 45,643

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825417

Int. Cl.³ G21K *5/10*

U.S. Cl. 250—442 **10 Claims**



1. A method for adjusting a specimen supported by a specimen support of a corpuscular beam apparatus, such as an electronmicroscope, in relation to the axis of the beam of said apparatus, comprising the sequential steps of:

coupling said specimen support to a specimen table having at least one angular adjustment axis;

making a first adjustment of said specimen table in two coordinate directions in a plane normal to said beam axis so that a selected portion of said specimen intersects said beam axis;

releasing said specimen support from said table and coupling said specimen support to a support member which remains substantially in a fixed position in relation to said axis of said beam as determined by said first adjustment, as long as said specimen support is coupled to said support member;

making a second adjustment of said specimen table to align said angular adjustment axis with said beam axis; and

returning said specimen support, which has been maintained by said support member in the position selected by said first adjustment, to said specimen table, whereby said specimen may be rotationally adjusted while maintaining said selected portion on said beam axis.

4,292,524

EXAMINING DEVICE FOR DETERMINING LOCAL ABSORPTION VALUES IN A SLICE OF A BODY

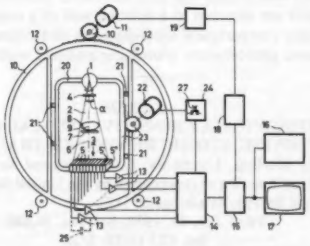
Cornelius B. J. d. Albrecht, and Jan J. M. Mulleneers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1978, Ser. No. 948,736

Claims priority, application Netherlands, Oct. 14, 1977, 7711285

Int. Cl.² A61B *6/00*

U.S. Cl. 250—445 T **6 Claims**

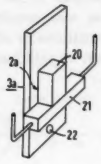


1. An examining device for determining local absorption values in a slice of a body, comprising a radiation source for generating a beam of radiation which irradiates the body, radiation direction means for irradiating the slice in a number of different directions, the radiation beam being situated in the slice to be examined, and an array of detectors which covers the entire beam and which serves for converting the radiation emerging from the body into electrical measuring values, characterized in that the examining device further comprises amplifier circuits, each of which is connected to a detector, a sensitivity of an amplifier circuit associated with a detector which is situated in or in the vicinity of the centre of the array of detectors being higher than a sensitivity of an amplifier circuit which is connected to a detector at or in the vicinity of an end of the array of detectors.

4,292,525
DIAGNOSTIC RADIOLOGY APPARATUS FOR PRODUCING LAYER IMAGES OF AN EXAMINATION SUBJECT

Edgar Tschunt, Rathsberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 68,230
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840965
Int. Cl.³ A61B *6/00;* **G01T** *1/20;* **H01J** *35/16*
U.S. Cl. 250—445 T **5 Claims**



1. In a diagnostic radiology apparatus for producing layer images of an examination subject with a patient support, a measuring arrangement for irradiating the examination subject from various directions including a radiation source adapted to emit a radiation beam which penetrates the layer to be examined, a radiation receiver which supplies electrical output signals corresponding to the radiation intensity measured, and a measured value converter connected with the radiation receiver for computing from the output signals of the radiation receiver attenuation values of specific image points of the irradiated body layer, an improvement to the radiation receiver comprising:

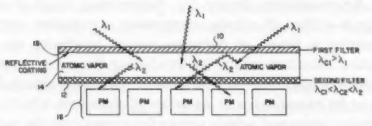
a collimator grid formed with a plurality of spaced apart compartments with a detector located at least partly in each said compartment,

each said detector comprises a scintillating crystal with an optical output and an associated photoelectric transducer adapted to sense light emitted from said optical output, each said crystal and said associated photoelectric transducer are attached to a selected wall of a respective collimator compartment whereby each said crystal, said associated photoelectric transducer and said wall form a unit.

4,292,526
ISOTROPICALLY SENSITIVE OPTICAL FILTER EMPLOYING ATOMIC RESONANCE TRANSITIONS

John B. Marling, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 21, 1979, Ser. No. 50,860
Int. Cl.³ G02B *5/20*
U.S. Cl. 250—458 **19 Claims**



1. A method for detecting light at a first wavelength λ_1 comprising the steps of:

providing an atomic vapor having atoms at a first energy level and capable of absorbing light at said first wavelength λ_1 and, having absorbed said light at said first wavelength λ_1, fluorescing light at a second wavelength λ_2;

providing a first optical filter chosen to transmit said first wavelength λ_1 and block said second wavelength λ_2;

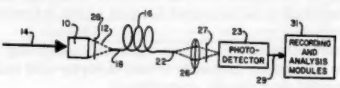
providing a second optical filter spaced apart from said first optical filter and partially defining a cavity therewith for containment of said atomic vapor, said second optical filter being chosen to block said first wavelenght λ_1 and transmit said second wavelength λ_2; and

subjecting said atomic vapor to irradiation by light at said first wavelength λ_1 thereby causing said atoms having said first energy level to be excited to a second higher energy level by absorption of light at a narrow band wavelength centered at λ_1, said excited atoms then fluorescing at a fluorescence wavelength λ_2 to a third energy level lower than said second energy level whereby light at said first wavelength λ_1 passing through said first optical filter is converted to light having said second wavelength λ_2 passing through said second optical filter.

4,292,527
RADIATION DETECTION SYSTEM

Larry A. Franks; Stephen S. Lutz, both of Santa Barbara, Calif., and Peter B. Lyons, Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 6, 1978, Ser. No. 949,163
Int. Cl.³ G01J *1/58;* **G01T** *1/16;* **C09K** *11/06*
U.S. Cl. 250—483 **29 Claims**



1. A radiation detection system comprising:

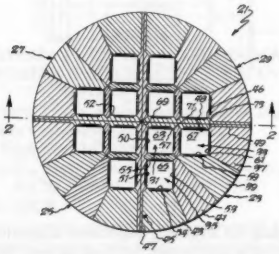
a. means for emitting light at wavelengths greater than about 500 nm with a decay time of less than about 10 ns in response to the detection of radiation, and

b. a fiber optic wave guide positioned to receive said emitted light at its one end for the transmission of said light to a desired location.

4,292,528
CASK FOR RADIOACTIVE MATERIAL AND METHOD FOR PREVENTING RELEASE OF NEUTRONS FROM RADIOACTIVE MATERIAL

Peter T. B. Shaffer, Grand Island, and Michael F. Gaffney, Ransomville, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Jun. 21, 1979, Ser. No. 50,908
Int. Cl.³ G21F *5/00*
U.S. Cl. 250—506 **18 Claims**



1. A cylindrical cask for nuclear reactor fuel which comprises a plurality of longitudinally extending walled internal compartments for containing such material and for absorbing

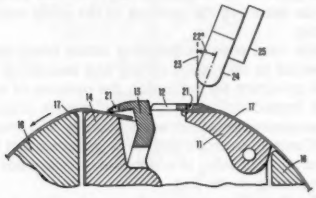
radiation emitted by such material, at least some of which compartments are of four interchangeable wall members of the same shape that are fitted together at sides thereof to make such compartments of square cross-section, which wall members have bodies of a material selected from the group consisting of stainless steel, copper, aluminum and silver, and have as inserts in such bodies neutron absorbing plates of boron carbide particles in a matrix of phenolic polymer to bar movements of neutrons emitted from the nuclear fuel, and a plurality of thermally conductive members about such walled compartments to carry heat away from the nuclear fuel and from compartments containing such fuel, which members are in thermal contact with the compartment walls and in thermal contact with each other along surfaces thereof, said surfaces extending radially from such compartments to external surfaces of such thermally conductive members, which external surfaces form an outer cylindrical wall of the cask, with such thermally conductive members being of a material selected from the group consisting of copper, aluminum and silver, and with at least some of them being of the same shape as other such members, and radiation absorbing means and thermally conductive covers therefor at ends of the cask for preventing radiation emissions at such ends and for conducting heat away from the nuclear fuel at such ends of the cask.

4,292,529

MISFEED DETECTOR

Thomas R. Thurston, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1979, Ser. No. 24,756
Int. Cl.³ G01N *21/86*
U.S. Cl. 250—561 **30 Claims**



1. Apparatus for sensing registration of a sheet comprising:

a registration plate having a reference edge at which the sheet may be registered and an aperture through which the presence of the sheet adjacent the reference edge may be detected;

means for scanning across said registration plate and across the aperture therein, said scanning means sensing no transition or one transition in the scan signal when the sheet is not under the aperture and sensing two transitions when the sheet is registered under the aperture.

4,292,530

DEVELOPER MATERIAL LEVEL SENSOR

Robert F. Nepper, North St. Paul, and Dennis L. Peterson, Brooklyn Center, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 3, 1980, Ser. No. 126,322
Int. Cl.³ G01N *21/26*
U.S. Cl. 250—577 **7 Claims**

1. Apparatus for use to provide an electrical signal when developer material for a copy machine recedes to a predetermined level including:

a container for developer material,

a shaft mounted longitudinally within said container and adapted for rotation about its axis,

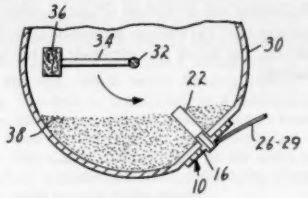
an arm means secured to and extending radially from said shaft for movement with said shaft,

a cleaning member secured to the free end portion of said arm means,

a light generating means,

a light to electric transducer means,

a support means carrying said light to electric transducer means and said light generating means so light from said light generating means is directed to said light to electric transducer means, said support means secured to said container and positioning said light generating means and



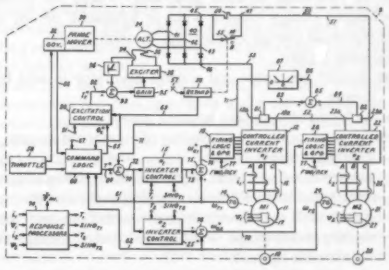
said light to electric transducer means within said container in relation to the predetermined level for the developer material and relative to said cleaning member so rotation of said arms means carries said cleaning member between said light generating means and said light to electric transducer means and in contact with support means to displace any developer material that is present in the light path between said light generating means and said light to electric transducer means.

4,292,531

ELECTRICAL PROPULSION PROCESS AND SYSTEM FOR A TRACTION VEHICLE WITH AN ON-BOARD SOURCE OF POWER

Dennis F. Williamson, Kingston, Canada, assignor to General Electric Company, Erie, Pa.

Continuation-in-part of Ser. No. 864,422, Dec. 27, 1977, abandoned. This application Mar. 2, 1979, Ser. No. 16,755
Int. Cl.³ B60L *11/02*; B61C *9/38*; H02P *5/28*; H02M *5/45*
U.S. Cl. 290—14 **11 Claims**



7. An improved propulsion system for a traction vehicle having an on-board source of power, said vehicle being equipped with at least one adjustable speed a-c traction motor energized by the alternating output current of a variable-frequency controlled current, static electric power inverter, the improvement comprising in combination:

a. a traction alternator having armature and field windings and a rotor driven by a prime mover;

b. means for exciting the field winding of said alternator;

c. means for converting the alternating output current of the armature windings of said alternator to a unidirectional current;

d. means connected between said converting means and d-c input terminals of said inverter for feeding said unidirectional current to said inverter, said current feeding means

consisting of a d-c link characterized by inductance of insufficient value to appreciably smooth said unidirectional current and by capacitance of insufficient value to appreciably smooth the d-c terminal voltage of said inverter;

e. means for controlling the switching frequency of said inverter so as to vary the fundamental frequency of its alternating output current as desired; and

f. means for controlling said field winding exciting means so as to vary, as desired, the fundamental amplitude of the alternating output current of said armature windings and consequently the average magnitude of said unidirectional current and hence the amplitude of the inverter output current.

4,292,532

TWO-STAGE ELECTRIC GENERATOR SYSTEM

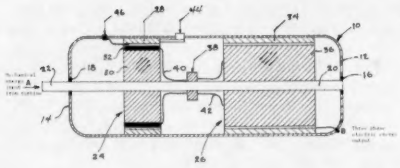
Adrien Leroux, Sherbrooke, Canada, assignor to h.o.p. ConsuLab Inc., Quebec, Canada

Filed Apr. 2, 1980, Ser. No. 136,707

Claims priority, application Canada, Mar. 14, 1980, 347792

Int. Cl.³ H02P *9/04;* H02K *19/12*

U.S. Cl. 290—6 **4 Claims**



1. A two-stage electric generator system for converting mechanical energy from a wind or hydraulic driven turbine into electrical energy comprising, in combination:

housing means;

an exciter generator and a main generator in said housing means;

a shaft rotatable in said housing means;

said exciter generator consisting of permanent magnet means mounted to said housing means and of a rotor rotatably supported on said shaft, said rotor being made of non-magnetic material to eliminate cogging and static torque associated with permanent magnet excitation, said rotor including a one-phase winding distributed around the circumference thereof;

said main generator consisting of a three-phase stator winding on a magnetic core mounted to said housing means and of a pole-type rotor rotatably supported on said shaft and having a winding wound on a magnetic core;

a rectifying bridge rotatably mounted to said shaft;

first means electrically connecting said one-phase winding to said rectifying bridge; and

second means electrically connecting said rectifying bridge to said winding to said main generator rotor whereby rotation of said shaft as a result of mechanical energy applied thereon generates a three-phase electric energy output from said stator winding; and

means for controlling the normalized power versus speed curve of the generator so that the curve intercepts the power versus speed curve of the turbine to assure a stable operating point around design speed.

4,292,533

MOTORING CONTROL FOR HYDRAULIC PUMP-TURBINE

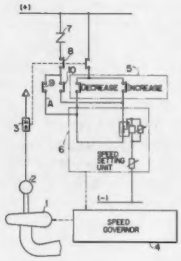
Toshiaki Yokoyama, Hitachi; Akira Hara, Hitachiota, and Takeshi Okuyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1978, Ser. No. 967,516

Claims priority, application Japan, Dec. 9, 1977, 52/147111

Int. Cl.³ G05D *13/02*

U.S. Cl. 290—40 B **5 Claims**



1. In a hydraulic turbine control apparatus comprising a prime mover including an electric generator, and a hydraulic turbine having movable guide vanes, drivingly connected to said generator; means to synchronously electrically connect said motor-generator to an electric power system including a synchronous on-off unit; a speed governor governing the speed of said prime mover; and a speed setting unit associated with said speed governor, wherein the improvement comprises:

means for detecting the position of the guide vanes of said turbine;

said guide vane position detecting means being operatively connected to said speed setting unit associated with said speed governor for increasing the opening of said guide vanes immediately after the synchronous connection of said generator to said power system by said synchronous on-off unit, to override said speed governor and to exceed a fixed opening value at which said turbine is not placed in the motoring mode; and

means for thereafter resetting the speed setting in said speed setting unit associated with said speed governor to the value corresponding to the standard frequency of the voltage in said power system and returning control of the opening of said movable guide vanes to said speed governor.

4,292,534

POWER AND SPEED CONTROL DEVICE FOR A TURBO-GENERATOR SET

Dieter Diegel, Röttenbach, and Heinz-Alfred Borgmann, Mülheim, both of Fed. Rep. of Germany, assignors to Kraftwerk Union AG, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Jan. 17, 1980, Ser. No. 113,118

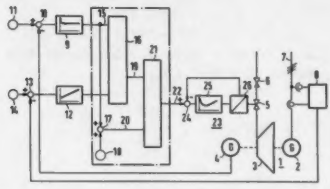
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1979, 2903039

Int. Cl.³ F01B *25/06*

U.S. Cl. 290—40 R **1 Claim**

1. Power and speed control device for a turbo-generator set having a generator, a turbine, and a governing valve with a positioning control input, for regulating steam fed to the turbine, comprising a turbine speed controller and a turbine power controller each having an output; a maximum selection circuit, a minimum selection circuit and a summing stage each having a first and a second input and an output, and means for supplying a constant reference value to said first input of said summing stage, each of said outputs of said controllers being connected, respectively, to an input of said maximum selection circuit for switching between speed and power control, said

output of said speed controller being additionally connected to said second input of said summing stage, said output of said summing stage being connected to said first input of said minimum selection circuit, said output of said maximum selection



circuit being connected to said second input of said minimum selection circuit, and said output of said minimum selection circuit being fed to the positioning control input of the governing valve.

4,292,535

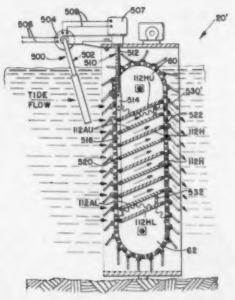
MODULAR CURRENT POWER APPARATUS

Richard E. Diggs, 12A Rd., Carthage, Mo. 64836

Continuation-in-part of Ser. No. 692,378, Jun. 3, 1976, abandoned. This application Sep. 3, 1980, Ser. No. 183,968

Int. Cl.³ F01D *23/00*

U.S. Cl. 290—54 **4 Claims**



1. Apparatus for converting water movement from one to two opposing directions into usable power comprising:

a plurality of modules, each module including:

a supporting structure mounted on the bed of a waterway so that water flows from an upstream side of said supporting surface to a downstream side thereof, said supporting structure including a pair of spaced piers embedded in the bed of the waterway, a [illegible]f standards fixed to said piers to extend vertically upwards therefrom, a module frame detachably connected to said standards, said module frame including a pair of vertical stanchions each slidably attached to one of said vertical standards, a top frame member connected to said stanchions and a bottom frame member connected to said stanchions, an anchor cable attached to said frame and a thrust anchor embedded in the waterway bed at a location spaced from said supporting structure, said anchor cable connecting said supporting structure to said thrust anchor to support said structure against force generated thereon by water moving through the waterway;

a sprocket wheel rotatably mounted on said supporting structure;

a power generating means mounted on said supporting structure and connected to said sprocket wheel to be operated by rotation of said sprocket wheel, said power generating means including a dynamo and a speed controlling means connecting said sprocket wheel to said dynamo;

an endless chain trained around said sprocket wheel to define an elongate loop having a longitudinal axis which is oriented to be essentially vertical so that said chain has an upstream reach located adjacent said supporting structure upstream side and a downstream reach located adjacent said supporting structure downstream side, said chain including a plurality of pivotally connected chain links;

a multiplicity of planar guide vanes movably mounted on said supporting structure to extend transversely across said supporting structure from a point immediately adjacent said upstream reach to a point immediately adjacent said downstream reach to define a multiplicity of linear raceways through which water flowing through said supporting structure is conducted in a multiplicity of separate rectilinear paths through said structure from said upstream reach of said chain to said downstream reach thereof so that a substantial portion of the areas within said chain loop is subdivided into a multiplicity of separate rectilinear paths by said guide vanes;

a plurality of elongate planar blades including side and end edges and pivotally connected to said chain by a connecting means to extend outwardly of said chain loop in both of said reaches and to a tilt downwardly in both of said chain reaches to be at an angle greater than 45° with respect to flow direction of water flowing in the body of water so that water located on said upstream side of said structure impacts said downwardly disposed blades when they are located in said upstream reach and drives said blades by impact force and water exiting from said raceways impacts said downwardly disposed blades when they are located in said downstream reach and drives said blades by impact force so that said blades are impacted by water at least twice during a single revolution of said chain about said sprocket wheel, said planar blades being arranged so an outer end edge of one blade overlaps an inner end edge of a next adjacent blade so that an imbricated orientation for said blades is defined in both of said reaches, said connecting means including a first connecting means located adjacent one of said side edges of said blade, and a second connecting means located adjacent the other side edge of said blade with each connecting means including a first coupling member connected between and to a pair of adjacent chain links, said first coupling member being located on one side edge of said chain, and further including a second coupling member located on another side edge of said chain, a plurality of coupler means each comprising a clevis and a clevis pin pivotally connecting said clevis to said connecting means so that said clevis extends outwardly of said chain, a pair of V-shaped stop arms located between said blade and said chain and fixed to side edges of each of said clevises and having link engaging means thereon including an elongate link engaging bar connected at both ends to said stop arms to engage links of said chain to constrain the pivotal movement of said coupler means, and attaching means attaching said blade to said coupler means; and

guide vane moving means which includes a tidal current flow direction sensing means having a part thereof submerged, a sensor means connected to said flow direction sensing means and having an output generating means which generates an output dependent upon the direction of movement of said flow direction sensing means relative to said supporting structure, a guide vane moving means mounted on said supporting structure and connected to said output generating means to be controlled thereby, said moving means including a shaft which moves according to an output signal generated by said output means, and a drive arm connected to said shaft to be moved thereby, said guide vanes each having one end thereof pivotally connected to said drive arm and another end thereof pivotally connected to said supporting structure to be tilted in as said drive bar is moved by said shaft so that

said guide vanes are moved in response to flow direction changes of water movement in a waterway.

4,292,536

RADIATION METHOD AND ASSEMBLY FOR ASSESSING WEB PARAMETERS

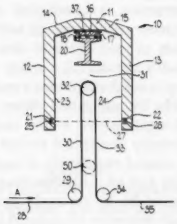
Ivor Cameron, Dumfries, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 27, 1979, Ser. No. 62,225

Claims priority, application United Kingdom, Aug. 7, 1978, 32466/78

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—359 **7 Claims**



1. An assembly for assessing variations in a radiation-sensitive parameter of a moving web by monitoring radiation transmitted by the web comprising

a stirrup-like cradle having a root portion, and extending therefrom, a pair of confronting limbs relatively spaced apart and dimensioned to define a bight to accommodate a web introduced and withdrawn along a path between the free ends of the limbs and the root portion,

a mounting for a source of radiation on a distal portion of one limb,

a mounting on a distal portion of the other limb for a detector to monitor radiation emitted by the source across the bight, and

means for supporting the cradle about the web path.

4,292,537

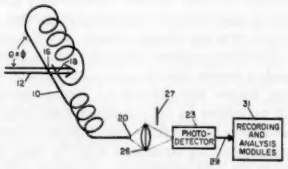
SYSTEM FOR TESTING OPTICAL FIBERS

Terence J. Davies; Larry A. Franks, and Melvin A. Nelson, all of Santa Barbara, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 868,636, Jan. 11, 1978, abandoned. This application Aug. 26, 1980, Ser. No. 181,511

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—361 R **7 Claims**



1. A method for nondestructively determining the attenuation coefficient $\alpha(\lambda)$ of a length of fiber optic wave guide comprising:

a. Launching identical light pulses at essentially the same time at a plurality of locations along said wave guide for transmission toward one end thereof,

b. Detecting the time of arrival and intensity of said light pulses at selected wavelengths of said pulses at said one end, and

c. Utilizing said time of arrival and intensity information to unfold the $\alpha(\lambda)$.

4,292,538

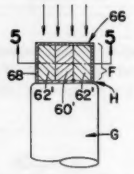
SHAPED DETECTOR

Roland W. Carlson, Lyndhurst, Ohio, assignor to Technicare Corporation, Cleveland, Ohio

Filed Aug. 8, 1979, Ser. No. 64,835

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—367 **55 Claims**



1. A computerized tomographic scanning apparatus for examining a planar slice of an object in the plane of a scan circle with radiation and producing a representation of an image of the planar slice, comprising:

at least one source of radiation for producing at least a beam of radiation in the plane of said scan circle;

radiation detector means for producing electrical signals in response to received radiation, said detector means disposed to receive radiation from the source which has traversed the scan circle, said detector means having a non-constant spatial response in at least a first dimension in the plane of the scan circle; and

processing means for processing the electrical signals from the detector means to produce the representation of an image.

4,292,539

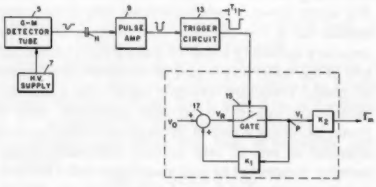
COMPENSATED COUNT-RATE CIRCUIT FOR RADIATION SURVEY METER

Richard A. Todd, Powell, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 12, 1980, Ser. No. 148,862

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—374 **6 Claims**



1. In a radiation survey meter comprising an ionizing radiation detector which produces pulses at an output thereof dependent upon the radiation dose rate and having a counting loss due to a known detector dead time, a trigger circuit means for producing fixed-width pulses at an output thereof in response to each of said pulses from said detector and an indicating current meter for indicating the radiation dose rate in response to a pulsed meter current flowing therethrough, a count rate compensating circuit, comprising:

means for generating a reference voltage that is a function of the rate of said pulses from said trigger circuit;

meter current-generating means for generating said meter current proportional to the rate and amplitude of pulses applied to the input thereof; and

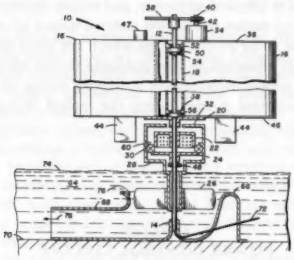
gating means responsive to the pulse rate from said trigger circuit for gating said reference voltage to the input of said current-generating means for the duration of each of said fixed-width pulses from said trigger circuit means so that said metering current generated by said current-generating means is compensated for counting losses due to the known detector dead time and is thus directly proportional to the actual radiation dose rate.

4,292,540

WIND-POWERED IMPELLER-MIXER

Worthington J. Thompson, 109 Powell St., Snow Hill, Md. 21863, and Peter A. Freeman, Box 2210, Ocean Pines, Berlin, Md. 21811

Filed Jul. 30, 1980, Ser. No. 173,694
Int. Cl.³ F03D *9/02, 3/02;* **F04D** *13/08*
U.S. Cl. 290—55 **21 Claims**



1. A wind-powered impeller-mixer, comprising:

a center mast member;

a wind rotor structure, said wind rotor structure being rotatable located around said center mast member;

a solenoid means, said solenoid means being affixed to said center mast member and having an armature means, said armature means being slidably located on said center mast member;

an impeller structure, said impeller structure being rotatably located around said solenoid means and below said wind rotor structure; and

a clutch means, said clutch means being located between said wind rotor structure and said impeller structure, separate parts of said clutch means being affixed to said wind rotor structure and to said impeller structure.

4,292,541

SAFEGUARD OR LOCK DEVICE

Bernd Ambrosius, In der Au 4-12, 6000 Frankfurt/Main-Rödelheim, Fed. Rep. of Germany

Continuation of Ser. No. 915,403, Jun. 14, 1978. This application Dec. 13, 1979, Ser. No. 103,176
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1977, 2726737
Int. Cl.³ B60R *25/04*
U.S. Cl. 307—10 AT **7 Claims**

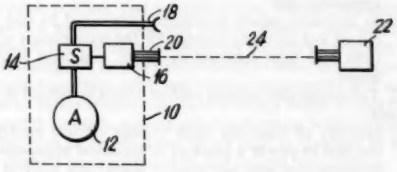
1. A device for safeguarding an engine against unauthorized use, said engine having a starter therefor, and a starter mechanism switch for switching on said starter, said device comprising:

a code signal receiver located in an immediate vicinity of said starter and said starter mechanism switch, said code signal receiver including a decoder to determine an authorized pre-selected code signal combination, said decoder including means for engaging the starter mechanism switch for activation;

means for encasing said code signal receiver, said starter and said starter mechanism switch together within a unit structure to prevent access thereto;

said unit structure having only three connections extending from an interior thereof, a first of said connections being a mechanical connection from said starter for starting said engine, a second of said connections being lead lines for providing electrical energy to said starter, said starter mechanism switch and said code signal receiver, and a third of said connections being a code signal input line to said code signal receiver;

a neutral code signal generator for generating a code for transmission through said code signal input line to said code signal receiver, said code signal generator being spaced from said unit structure and being of relatively easy access to an authorized user of the engine;



said code signal input line providing means for electronically connecting said code signal generator to said code signal receiver;

code transmitter means for creating said authorized preselected code signal combination upon engagement with said code signal generator, which pre-selected code signal combination is thereupon electronically transmitted by said code signal generator to said decoder of said code signal receiver so that said decoder activates said starter mechanism switch; and

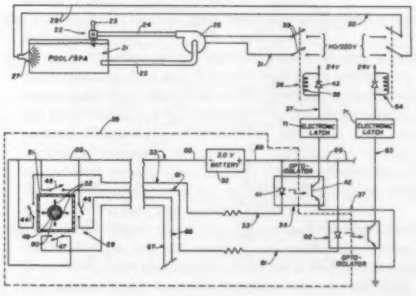
said code signal receiver further including time delay means to block forwarding of a following code signal combination for a predetermined time after receiving any first code signal combination to foil tampering by an unauthorized person using a count generator.

4,292,542

SUBMERSIBLE REMOTE CONTROL SWITCH ASSEMBLY

Peter Bajka, Los Altos, Calif., assignor to Compool Corporation, Mountain View, Calif.

Filed Apr. 14, 1980, Ser. No. 140,162
Int. Cl.³ H02J *13/00*
U.S. Cl. 307—28 **8 Claims**



1. Submersible remote control switch assembly for the control of electrically powered apparatus associated with a pool of

water, such as a spa, said electrically powered apparatus being electrically connected to a source of relatively high voltage electricity by a high voltage circuit, wherein the improvement in said switch assembly is comprised of:

an independent, relatively low voltage, source of electricity, and a low voltage circuit electrically coupled thereto;

manually engageable switch means electrically coupled to and interposed in said low voltage circuit and formed for selective opening and closing of said low voltage circuit, said switch means being insulated for submersion into a body of water without interfering with said low voltage circuit;

light emitting means mounted in said low voltage circuit and operable by said low voltage source of electricity upon closing of said low voltage circuit;

relay means mounted in an electrical relay circuit and formed to enable opening and closing of said high voltage circuit for selective actuation of said electrically powered apparatus; and

light activated means electrically connected to said relay circuit and optically coupled for the transmission of light from said light emitting means to said light activated means.

7. The submersible remote control switch as defined in claim 1, and

a plurality of relatively high voltage circuits electrically coupled to power a plurality of electrical apparatus used in connection with said pool of water; and wherein

said switch means includes a plurality of reed switches;

said low voltage circuit includes a plurality of low voltage circuits each electrically connected to individual ones of said reed switches and a source of relatively low voltage;

said relay circuit includes a plurality of relay circuits each having relay means therein coupled to open and close ones of said high voltage circuits; and

said light emitting means and said light activated means are provided by a plurality of opto-isolators electrically connected on light emitting sides thereof to said low voltage circuits and electrically connected on light receiving sides to said relay circuits.

4,292,543

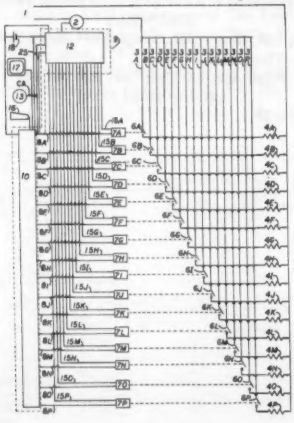
ELECTRICAL ENERGY MANAGEMENT DEVICES

Jerry K. Reed, Sr., 17 Maple St., Speed, Ind. 47172

Filed Sep. 21, 1979, Ser. No. 77,586

Int. Cl.³ H02H *1/06, 3/06, 3/24*

U.S. Cl. 307—35 **1 Claim**



1. Apparatus for minimizing peak load usage in selected electrical system having multiple electrical power loads where each load is provided electrical power source means by means of load power supply circuit means, including: first switch means disposed in selected load power supply circuit means, first switch operator means to selectively open and close said first switch means; real time clock means to supply real time to control means where the control means is adapted to actuate and deactuate each said first switch operator means at a preselected time to correspondingly open and close first switch means associated with the operator means where the control means prevents simultaneous actuation of more than one first switch operator means within a selected time interval; and power outage detector means to detect power interruption at the electrical power source means; second control means actuated by said control means upon resumption of power after power interruption, where the second control means is adapted to override the first control means in the event of power interruption and at the time of power resumption to sequentially reactivate said first switch means and load means which are to be in active condition at the real time of power resumption and where reactivation of said first switch means which can be activiated at time of power resumption occurs at selected time intervals and in selected sequence, and return control from the second control means to the first control means upon resumption of power to all switch means which are to be activated at time of power resumption; and alternate power supply means actuated by power interruption to supply power to said first and second control means during the period of rush power interruption.

4,292,544

POWER CONTROL CIRCUIT

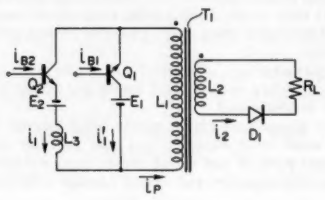
Masanori Ishii, Kawagoi, and Kazuo Kameya, Tsurugashima, both of Japan, assignors to Toko, Inc., Tokyo, Japan

Filed Nov. 16, 1978, Ser. No. 961,441

Claims priority, application Japan, Nov. 18, 1977, 52/138760

Int. Cl.³ H02M *3/10;* **H02J** *1/10*

U.S. Cl. 307—52 **5 Claims**

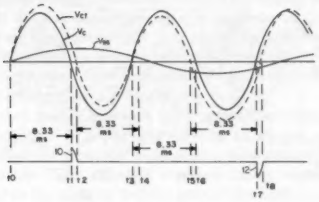


1. A power control circuit comprising a transformer having a primary winding and at least one secondary winding; a first series circuit including a first DC power source, a first transistor and the primary winding of said transformer; a second series circuit including said primary winding, an excitation coil arranged to flow through said primary winding a current which increases with time, a second DC power source and a second transistor; and a rectifier circuit connected with the secondary winding of said transformer, wherein an excitation current is first caused to flow through the primary winding of said transformer so that energy is stored therein; thereafter, a current opposite to said excitation current is caused to flow through said primary winding; a current which is induced in the secondary winding by the current flowing through the primary winding of said transformer and a current resulting from the stored energy are superimposed upon each other in said secondary winding; and a current resulting from the superimposition is rectified by said rectifier circuit so that an output is provided.

4,292,545
METHOD AND MEANS FOR DAMPING SUBSYNCHRONOUS OSCILLATIONS AND DC OFFSET IN AN AC POWER SYSTEM

Narain G. Hingorani, Los Altos Hills, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 30,691, Apr. 16, 1979. This application Jul. 23, 1979, Ser. No. 59,994
Int. Cl.³ G05F *1/12*
U.S. Cl. 307—102 **12 Claims**



6. Apparatus for damping subsynchronous oscillations and DC current offset in an AC power line comprising

reactance means serially connected in said power line,

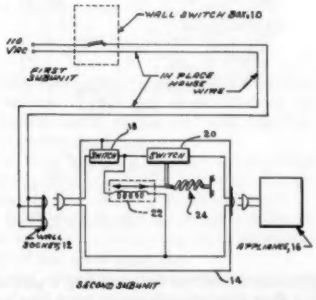
circuit means connected in parallel with said reactance means and including a resistor, a selectively bi-directional conduction means, and means connecting said selectively bi-directional conduction means with said resistor including a transformer having a primary winding and a secondary winding, said primary winding being serially connected with said resistor and said secondary winding being connected to said selectively bi-directional conduction means, and

means for triggering said selectively bi-directional conduction means in response to half-cycle time period of voltage across said reactance means exceeding a preselected time period.

4,292,546
APPARATUS FOR CONTROLLING POWER APPLICATION

Warren P. Clark, 10 Evans Dr., Wilmington, Mass. 01887

Filed Mar. 6, 1980, Ser. No. 127,688
Int. Cl.³ H02J *13/00*
U.S. Cl. 307—114 **3 Claims**



1. A power control apparatus for applying or removing power to an electrical appliance comprising in combination:

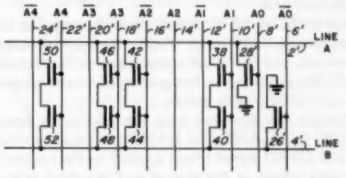
a first power control means connected to input power lines to receive the power thereon, said input power lines being connected to a wall socket, said first power control means comprising a normally closed momentary action switch, said switch being serially connected in one of said input power lines, and,

a second power control means connected to said wall socket by means of an electrical plug, said second power control means including a parallel pair of electrical wires from said electrical plug to an electrical socket mounted thereon, said second power control means comprising a solenoid means connected between said paraliel pair of electrical wires, and a first and second switch means, said first switch means connected in one of said electrical wires between said electrical plug and said solenoid means, said second switch means connected from the junction of said first switch means and said solenoid means to said electrical socket, said electrical socket receiving the input plug of an electrical appliance which is to be controlled, said first switch means comprising a normally closed momentary action switch, said second switch means mechanically connected to the plunger of said solenoid means by a mechanical linkage, said mechanical linkage connected to the frame of said second power control means by a spring, said second switch means having a first and second switch position, said solenoid means holding said second switch means in said first switch position, said solenoid means responding to a temporary current interruption by allowing said second switch means to move to said second switch position, after said current interruption said solenoid means returns said second switch means to said first switch position, said second switch means being switched between an on state and an off state in response to said solenoid means reaction to said current interruption.

4,292,547
IGFET DECODE CIRCUIT USING SERIES-COUPLED TRANSISTORS

James R. Pfiester, Austin, and Doyle V. McAlister, Pflugerville, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 27, 1979, Ser. No. 61,206
Int. Cl.³ H03K *19/094;* **G11C** *8/00;* **H01L** *29/52*
U.S. Cl. 307—463 **3 Claims**



1. A decoder circuit for selecting one of a plurality of output lines in response to address signals comprising:

(a) a plurality of address lines for conducting the address signals, the plurality of address lines including first, second and third address lines, the first and second address lines conducting address signals which are logical complements of each other;

(b) a plurality of output lines including a first and a second output line;

(c) first and second switching means each having a control electrode and first and second conduction electrodes, the first conduction electrode of the first and second switching means being coupled to a reference voltage source, the second conduction electrode of the first and second switching means being coupled, respectively, to the first and second output lines, and the control electrodes of the first and second switching means being coupled, respectively, to the first and second address lines; and

(d) third and fourth switching means each having a control electrode and first and second conduction electrodes, the first conduction electrodes of the third and fourth switching means being coupled, respectively, to the first and second output lines, the second conduction electrodes of the third and fourth switching means being coupled to each other, and the control electrodes of the third and

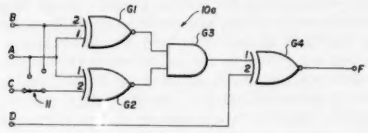
fourth switching means being coupled to the third address line for selectively effecting electrical coupling between the first and second output lines.

4,292,548

DYNAMICALLY PROGRAMMABLE LOGIC CIRCUITS

Ricardo Suarez, Estado Miranda; Oscar Chang, and Vladimir Adam, both of Caracas, all of Venezuela, assignors to Instituto Venezolano de Investigaciones Cientificas (IVIC), Venezuela

Filed Jul. 27, 1979, Ser. No. 62,233
Int. Cl.³ H03K *19/08, 19/20*
U.S. Cl. 307—465 **17 Claims**



1. A programmable logic circuit including at least one gate comprising:

first exclusive NOR circuit means having first input means, second input means and output means;

second exclusive NOR circuit means having first input means, second input means and output means, said first input means of said second exclusive NOR circuit means being coupled to said first input means of said first exclusive NOR circuit means;

AND circuit means having first input means, second input means and output means, said first input means of said AND circuit means being coupled to said output means of said first exclusive NOR circuit means and said second input means of said AND circuit means being coupled to said output means of said second exclusive NOR circuit means; and

third exclusive NOR circuit means having first input circuit means, second input circuit means and output circuit means, said first input circuit means of said third exclusive NOR circuit means being coupled to said output means of said AND circuit means;

whereby the least one gate can selectively function as an OR, NOR, AND and NAND circuit depending on ONE and ZERO signal levels applied to the respective second input means of the second and the third exclusive NOR circuit means as program variables, with one independent variable being applied to the first input means of the first exclusive NOR circuit means and to the first input means of the second exclusive NOR circuit means, and another independent variable being applied to the second input means of the first exclusive NOR circuit means.

4,292,549

MONOSTABLE MULTIVIBRATOR AND FM DETECTOR CIRCUIT EMPLOYING DIFFERENTIAL TRANSISTOR PAIR (THRESHOLD) TRIGGER CIRCUIT TO AVOID INTERFERENCE SIGNAL OPERATION

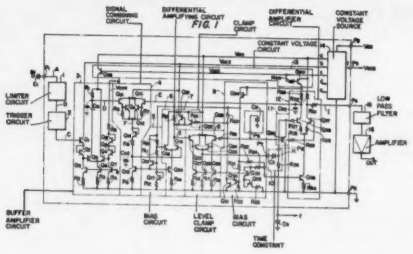
Takeshi Wada; Masanori Ienaka, both of Kodaira; Yasuo Kominami, Kokubunji; Yukihiko Miyamoto, and Tsuneo Yamada, both of Tokyo, all of Japan, assignors to Hitachi Ltd. and Trio Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 12, 1979, Ser. No. 3,120
Claims priority, application Japan, Mar. 15, 1978, 53-28662
Int. Cl.³ H03K *5/08, 3/033*
U.S. Cl. 307—247 R **7 Claims**

1. A monostable multivibrator circuit including a time constant circuit which includes a capacitor, an amplifier circuit which receives an output signal of the time constant circuit, a positive feedback circuit which is connected between an output end of the amplifier circuit and an input end of the time constant circuit, and trigger circuit means for applying a trigger signal and coupled to a circuit loop constructed of the time constant circuit, the amplifier circuit and the positive feedback circuit, characterized in that said trigger circuit means comprises:

a pair of transistors means;

impedance means connected to emitters of said pair of transistors means in common;



a trigger input terminal for applying the trigger signal and connected to a base of one of said pair of transistors means;

a feedback input terminal for receiving a feedback signal from said amplifier circuit and connected to a base of the other of said pair of transistors means; and

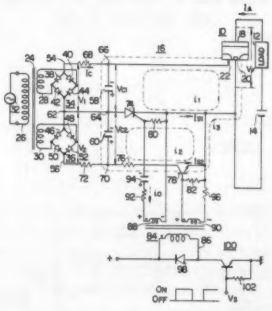
an output terminal coupled with said impedance means and coupled with an input end of said positive feedback circuit.

4,292,550

GATE CONTROL CIRCUIT WITH CAPACITOR FOR FIELD CONTROLLED THYRISTOR

Kenichi Onda, and Norikazu Tokunaga, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1979, Ser. No. 15,475
Claims priority, application Japan, Feb. 24, 1978, 53-19660
Int. Cl.³ H03K *17/60*
U.S. Cl. 307—252 A **7 Claims**



1. A gate control circuit for providing a gate control bias signal to a field controlled thyristor having an anode and a cathode coupled, respectively, to positive and negative terminals of a voltage source, and a gate coupled to said gate control circuit, wherein a current generated from said voltage source will flow from said anode to said cathode when said gate control circuit biases said field controlled thyristor with a gate-to-cathode negative bias voltage lower than a pinch-off voltage of the field controlled thyristor and wherein said current flow will be blocked when a gate-to-cathode negative bias voltage higher than the pinch-off voltage is applied to the field controlled thyristor by said gate control circuit, comprising:

a first d.c. source having a first positive terminal and a first negative terminal;

a capacitor having a second positive terminal connected to both the first positive terminal and the cathode of the field controlled thyristor, and having a second negative terminal connected to both the first negative terminal and the gate of the field controlled thyristor, the capacitance of said capacitor being so selected as to be large enough to store sufficient charge from said first d.c. source to turn off the field controlled thyristor;

first switching means connected between the second positive terminal of said capacitor and the cathode of the field controlled thyristor so that said capacitor will discharge to provide negative voltage between the gate and cathode of the field controlled transistor to turn it off when the first switching means is closed;

a second d.c. source having a third positive terminal and a third negative terminal, and having an output voltage higher than the pinch-off voltage, the third positive terminal and the third negative terminal being respectively coupled to the cathode and the gate of the field controlled thyristor; and

second switching means connected between the third positive terminal of said second d.c. source and the cathode of the field controlled thyristor, so that said second d.c. source will be coupled between the gate and cathode of the field controlled thyristor to hold it in its off state after turn-off when the second switching means is closed.

4,292,551
OPTOELECTRONIC COUPLING DEVICE FOR TRANSMITTING DC SIGNALS

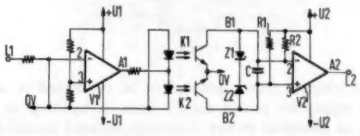
Ewald Kolmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 14, 1979, Ser. No. 103,434

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1979, 2903327

Int. Cl.[3] **H03F** *17/00;* **H03K** *5/04*

U.S. Cl. 307—311 **8 Claims**



1. An optoelectronic coupling device for transmitting digital signals from an input to an output, which input and output are electrically isolated from each other, said coupling device comprising in combination:

(a) an input stage including an input for receiving digital input signals from an incoming signal line and an output;

(b) an optoelectronic coupling circuit including:

(1) two luminescent diodes connected in series via a connector tap, said connector tap being connected to the output of said input stage; and

(2) two phototransistors arranged adjacent to respective ones of said luminescent diodes and having collectors and emitters, one of said collectors and said emitters of both phototransistors commonly connected to a first voltage source;

(c) an output stage including:

(1) an operational amplifier having an output, a non-inverting input and an inverting input, said non-inverting and inverting inputs each being connected to one of said emitters and collectors of both phototransistors not being connected to the first voltage source;

(2) two ohmic resistors, each connecting a second voltage source with a respective one of said non-inverting and inverting inputs of the operational amplifier; and

(3) a capacitor connected between said non-inverting and inverting inputs;

whereby said capacitor and respective ones of said resistors form RC circuits for removing a remaining charge of respective phototransistors when said phototransistors are cut off from saturation.

4,292,552
BIPOLAR VOLTAGE DETECTOR COMPRISING DIFFERENTIAL TRANSISTOR PAIRS

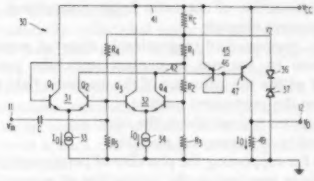
Kouichi Tanaka, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 971,148

Claims priority, application Japan, Dec. 20, 1977, 52-153935

Int. Cl.[3] **H03K** *5/153, 5/08*

U.S. Cl. 307—354 **3 Claims**



1. In a bipolar voltage detector comprising an input terminal for a bipolar input signal, an output terminal for an output signal, a power supply terminal for a power supply voltage, and transistor means connected to said input, said output, and said power supply terminals and having threshold levels predetermined for positive and negative components of said input signal for supplying said output signal, the improvement wherein said transistor means comprises:

a first transistor pair comprising a first and a second transistor having emitter electrodes connected in common,

a second transistor pair comprising a third and a fourth transistor having emitter electrodes connected in common,

a first and a second constant current circuit grounding the emitter electrodes of the transistors of said first and said second transistor pairs, respectively, to allow a preselected current to flow through each thereof,

biasing means for biasing base electrodes of said first and said thid transistors higher than base electrodes of said second and said fourth transistors, respectively, the differences between the base bias voltages of said first and said second transistors and between the base bias voltages of said third and said fourth transistors being determined by the threshold levels for said positive and said negative components, respectively,

a connection between collector electrodes of said first and said third transistors and said power supply terminal,

input means connected to said input terminal for superposing said input signal on each of the base bias voltages of said second and said third transistors,

output means coupled to collector electrodes of said second and said fourth transistors and said output terminal for transferring the collector outputs of said first and said fourth transistors to said output terminal, and

wherein said biasing means comprises means for producing a stabilized voltage, and resistors for dividing said stabilized voltage into the base bias voltages of said first through said fourth transistors, the base bias voltages of said second and said third transistors being equal to each other.

4,292,553

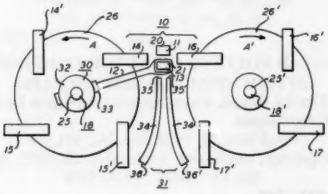
APPARATUS FOR GENERATING MECHANICAL ENERGY RESPONSIVE TO INTERACTION OF MAGNETIC FIELDS

Frank V. Deputato, 1116 79th St., North Bergen, N.J. 07047

Continuation of Ser. No. 789,072, Apr. 20, 1977, abandoned. This application Jan. 24, 1979, Ser. No. 6,184

Int. Cl.³ H02K *7/00*

U.S. Cl. 310—46 **13 Claims**



1. An apparatus for generating mechanical energy responsive to the interaction of magnetic fields, comprising:

(a) a permanent magnet;

(b) a core comprised of magnetizable material positionable proximate to, but not in contact with, the permanent magnet within the influence of the magnetic field emanating from the permanent magnet;

(c) a conductor wound about the core;

(d) a plurality of permanent magnets;

(e) means for supporting the plurality of permanent magnets, movable in response to the interaction of magnetic fields so as to move the permanent magnets to positions proximate the permanent magnet and magnetized core within the influence of the magnetic fields emanating therefrom;

(f) means for alternately conducting and not conducting electricity through the conductor, such that when electricity is conducted therethrough, magnetism is induced by flow of electricity about the core, of polarity such that the core repels each one of the plurality of permanent magnets as it moves to a position proximate thereto, and when electricity is not conducted, magnetism is induced in the core by the permanent magnet, of polarity such that the core attracts each one of the plurality of permanent magnets as it moves to a position proximate thereto, with the conductive cycle timed to coincide with the proximity to the core and permanent magnet of each one of the plurality of permanent magnets and with the nonconductive cycle timed to coincide with the approach to the core and permanent magnet of each one of the plurality of permanent magnets; and

(g) means for generating mechanical energy responsive to movement of the supporting means.

4,292,554

RADIALLY AERATED DISC ROTOR

Mihailo Starcevic, Mellingen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 8, 1979, Ser. No. 92,336

Claims priority, application Switzerland, Nov. 27, 1978, 12101/78

Int. Cl.³ H02K *9/00*

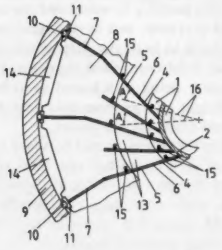
U.S. Cl. 310—58 **5 Claims**

1. A radially aerated disc rotor comprising:

a central hub having an axis and an outer diameter;

a plurality of ribs having one end connected to said hub, said ribs extending from said hub, said ribs each being canted from a radial line through said hub;

an annular disc being fixed to each axial edge of the other end of said canted ribs, said annular discs having an inner diameter greater than said outer diameter of said central hub, to form an annular portion therebetween wherein said central hub and said discs are connected only through said ribs, wherein an annular space exists between both said annular discs and said hub to admit the flow of cooling medium into the area between said ribs from both axial sides of said ribs; and



a rotor collar supported by said discs.

4,292,555

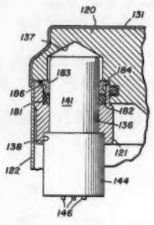
START WINDING CUT-OUT CIRCUIT FOR AN ELECTRIC MOTOR

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Continuation-in-part of Ser. No. 770,110, Feb. 18, 1977, which is a continuation-in-part of Ser. No. 618,359, Oct. 1, 1975, abandoned. This application Nov. 16, 1978, Ser. No. 961,465

Int. Cl.³ H02K *11/00*

U.S. Cl. 310—68 R **12 Claims**



1. An electric motor adapted to be connected to an AC power supply by power supply lines, comprising an outer casing, an electrical power connector secured to said casing and adapted to be fastened to said power supply lines, start and run windings in said casing and electrically connected to said connector, a capsule containing a start winding cutout switch, means for mounting said capsule in said casing with said capsule accessible from the exterior of said motor, and means within said casing and electrically connecting said switch with said start winding.

4,292,556

SPEED REDUCING EQUIPMENT, PARTICULARLY FOR VEHICLES

Jean-Marie Jollois, Courbevoie, France, assignor to Labavia-S.G.E., Paris, France

Filed Jul. 12, 1979, Ser. No. 57,003

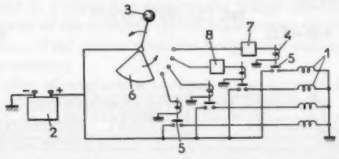
Claims priority, application France, Jul. 20, 1978, 78 21548

Int. Cl.³ H02K *49/00*

U.S. Cl. 310—93 **17 Claims**

1. A speed reducer device for a vehicle, comprising an electric retarder with n conductor windings, n being an integer chosen among 3, 4, and 5, a DC voltage source and control means with a control member having n+1 control positions for causing the retarder to generate n+1 braking torques whose values increase from 0 to a maximum value when the

control member passes from its 0 position to its n position, said subsequent passages resulting respectively in the connection of the source to a number of inductor windings increasing from 0 to n, wherein, if P is the maximum electrical power, comprised between 2000 and 3500 Watts, capable of being absorbed by the whole of the n inductor windings when they are all permanently connected to the source, without the corresponding heating damages the retarder, each of said windings is chosen so as to consume a power K^2P/n when it is connected to the source, K being a coefficient between 1.1 and 1.7, and safety means for automatically preventing the energization of the speed retarder to reach a dangerous threshold when the control member is in its last position n.



4,292,557

MOTOR WITH INTEGRAL CLUTCH

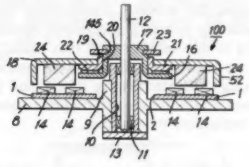
Yoshio Kishi, Hachiouji, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 2, 1979, Ser. No. 35,506

Claims priority, application Japan, May 10, 1978, 53-55378; May 10, 1978, 53-55379

Int. Cl.³ H02K 7/10

U.S. Cl. 310—78 **8 Claims**



1. A motor comprising:

a drive shaft mounted for rotation about its longitudinal axis;

a stator yoke extending radially in respect to said axis and containing magnetic material;

a rotor assembly mounted for rotation about said axis and for movement in the direction of said axis relative to said stator yoke, said rotor assembly including a rotor magnet which is in opposing relation to said stator yoke in said direction of the axis and which produces a magnetic attraction therebetween tending to move said rotor magnet in said direction toward said stator yoke;

driving coil means on said stator yoke for generating a rotating magnetic field interacting with said rotor magnet so as to urge said rotor assembly to rotate; and

first and second clutch members secured to said rotor magnet and said drive shaft, respectively, and having portions which are in opposing relation to each other in said direction of the axis and which are urged to frictionally engage each other by movement of said rotor magnet in said direction toward the stator yoke in response to said magnetic attraction, whereby to transmit a torque from said rotor magnet to said drive shaft which has a maximum value proportional to said magnetic attraction produced between said stator yoke and said rotor magnet.

4,292,558

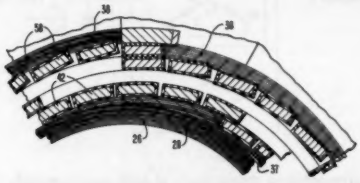
SUPPORT STRUCTURE FOR DYNAMOELECTRIC MACHINE STATORS SPIRAL PANCAKE WINDING

Carl Flick, Pittsburgh, and Sui-Chun Ying, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 15, 1979, Ser. No. 66,732

Int. Cl.³ H02K 1/00

U.S. Cl. 310—194 **7 Claims**



1. A dynamoelectric machine comprising:

a frame structure; and

a substantially cylindrical stator structure having a longitudinal axis, said stator structure being supported by said frame, said stator structure comprising

a plurality of electrical coils, each of which comprise an electrical conductor formed in a plurality of concentric turns which are serially electrically connected, said turns in each coil spiraling outwardly about the longitudinal axis,

rigid foundation means, disposed within the concentrically innermost turn of each coil, for structurally supporting the turns of each coil, and comprising a support member lying in a curved plane which corresponds to the spiral shape of the associated coil, said member's plane thickness perpendicular to said spiral being less than or equal to said associated coil's conductor's thickness perpendicular to said spiral, and

means for structurally connecting said turns of each coil with said supporting foundation means of each coil including a first plurality of bands protruding through said support member and in engagement with said turns, said engagement being on said turn's remote side relative to said support member, said bands being disposed at selected axial and circumferential locations.

4,292,559

ELECTRIC DRIVE WITH A UNIVERSAL AND INDUCTION MOTOR COMBINED ON A COMMON LAMINATION STACK

Herbert Auinger, Nüremberg; Peter Bradler; Rüdolf Weppler, both of Lengfeld, and Jaroslav Stepina, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,522

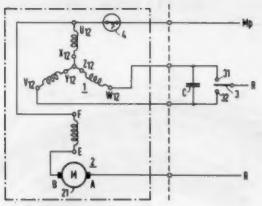
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1977, 2744472

Int. Cl.³ H02K 23/30

U.S. Cl. 310—206 **10 Claims**

1. In an electric two motor drive including means for separately connecting each motor to a single phase AC line service as the only supply source comprising a stator winding of a commutator motor having a lower pole number and a stator winding of an induction motor having a higher pole number arranged in the common stator lamination stack, and a common armature which forms short circuits to give a number of poles corresponding to a higher pole number of the exciting induction motor stator field from series connected coils in each phase winding and a segmented commutator, the segments of which form circuits with a number of poles corresponding to the lower pole number of the exciting commutator stator field the improvement comprising a common single armature wind-

ing system provided for the commutator as well as the induction motor operation, said winding having an uncrossed lap winding and a crossed lap winding connected to the same segments of the commutator, the coil span of said windings



corresponding respectively at least approximately to one pole pitch of the lower pole number commutator stator winding and to an uneven integral multiple of the pole pitch of the higher pole number induction stator winding.

4,292,560

TACHOMETER GENERATOR BRUSH CARRIER

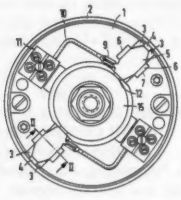
Albin Vorndran, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,583

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804681

Int. Cl.³ H02K *13/00*

U.S. Cl. 310—242 **4 Claims**



1. In a tachometer generator having a brush carrier of insulating material which is fastened to the tachometer housing at the end face and which supports at least two brush holders each acting, together with the brush carrier, to form a brush guide for a carbon brush and its coil spring, each coil spring being braced against an abutment of the brush holder, there being means by which an electric wire can be connected to the brush holder, the improvement comprising:

a channel comprising axially projecting ribs formed on the brush carrier for guiding each brush,

cut-outs in the brush carrier on the outside of the axially projecting ribs of each channel, and

a plate-shaped brush holder resting on the axially projecting ribs of each channel and having axially projecting, laterally resilient, spreading arms axially directed into the cut-outs of the brush carrier and engaging the cut-outs in a snap-on connection, the brush holder having an abutment to which the coil spring is firmly connected.

4,292,561

ATTENUATING MEANS FOR ELECTROACOUSTIC TRANSDUCER

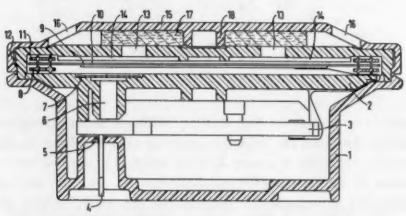
Erwin Martin, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,408

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831411

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—322 **8 Claims**



1. In an electroacoustic transducer having a transducer membrane disposed in a cavity by means of which the volume in the cavity is subdivided into a front membrane space and a rear membrane space, and with a mounting cap terminating the front membrane space and which is provided with acoustic transmission openings, and in which an attenuating means is provided in the front membrane space for the attenuation of resonance ratio effects, the combination of a separation plate disposed in the front membrane space between the membrane and the attenuating means, the separation plate being provided with acoustic transmission openings therein all of which lie radially inwardly of the mounting cap acoustic openings, the attenuating means disposed in the area of the separate plate extending across the acoustic transmission openings therein, and the attenuating means and acoustic openings being positioned relative to one another such that sound waves entering through the cap acoustic openings travel laterally and radially inwardly through the attenuating means and then out of the attenuating means into the separation plate acoustical openings towards the transducer membrane.

4,292,562

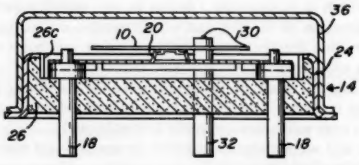
MOUNTING ARRANGEMENT FOR CRYSTAL ASSEMBLY

Alvin Feder, Lauderhill, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 3, 1979, Ser. No. 35,373

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—348 **6 Claims**



1. A crystal mounting arrangement comprising in combination:

a crystal plate having a plurality of conductive areas on a first surface thereof;

a conductive bridge span member having three connected collinear portions, the end portions having a first, angled position and a second, coplanar position, relative to the center portion, and the center portion having an elevated

section, the crystal plate being attached to the elevated section;

two bridge support members for supporting the bridge span member, without fixed attachment when the end portions of the span member are in the first position and fixedly attached to the span member when the span end portions are in the second position;

a non-conductive carrier having a depressed portion dimensioned to receive and support the bridge structure with portions of the attached crystal plate resting on the upper surface of the carrier when the bridge span ends are in the first position;

a plurality of conductive terminal means supported by the carrier and positioned beyond and adjacent the edge of the plate; and

a plurality of wire bonds each conductively attached at one end to a respective one of the conductive terminals on the carrier and conductively attached at the other end to a respective one of the conductive areas on the upper surface of the crystal, the bonds having been made while the bridge span ends are in the first position and the crystal is supported on the carrier surface.

4,292,563

MULTIPLE CATHODE X-RAY TUBE FOR DENSITOMETERS

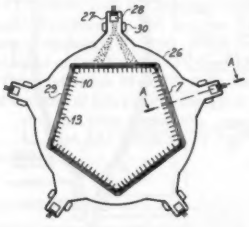
Emile Gabbay; Dang Tran Quang, and Andre Lafitte, all of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Jan. 23, 1979, Ser. No. 5,767

Claims priority, application France, Jan. 27, 1978, 78 02340

Int. Cl.³ H01J *35/16, 35/30*

U.S. Cl. 313—56 **9 Claims**



1. An X-ray tube, for tomodensitometers in particular, containing:

an envelope **(26)** in the form of a ring, fitted with collars **(27)** in which cathodes **(28)** are placed,

an anode assembly functioning by transmission which is arranged along the sides of a regular convex polygon, each cathode being on the median line of one side **(29)** of this polygon,

a beam deviation device **(30)** associated with each cathode **(28)** for sweeping the relating side of the polygon,

a collimation device **(10)** with several openings placed in front of the anode assembly to produce a series of fine X-ray beams which are roughly parallel and coplanar when the electron beams emitted by the cathodes **(28)** sweep the anode assembly, the number of beams being equal to the number of openings in the collimation device **(10)**.

4,292,564

LAMP/REFLECTOR UNIT

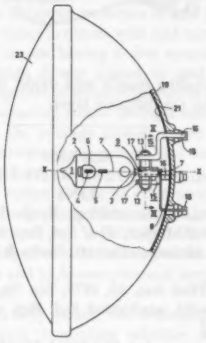
Volker Kuhnert, Kerkrade, Netherlands, and Dieter Wilhelm, Eschweiler, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,527

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829677

Int. Cl.³ H01J *5/16, 5/48, 5/50*

U.S. Cl. 313—318 **3 Claims**



1. A lamp/reflector unit having a concave reflector member and a lens member attached thereto, a tubular light bulb being supported in spaced relation to the reflecting surface of said reflector member, said light bulb having a pinch seal at one end thereof which is substantially rectangular in cross-section and from which current conductors emanate, said bulb including a filament disposed therein, said current conductors being in electrical contact with said filament disposed within said light bulb, said reflector member having mutually electrically insulated contact members, said unit including support pins attached to each of said contact members, each of said support pins also being connected to one of said current conductors, characterized in that the pinch seal is secured between two opposed mounting clips which each engage around a respective narrow side of the pinch seal in a clamping manner, each of said mounting clips having an elongate intermediate member attached thereto which extends at least over a part of its length along an imaginary circle having its center on the axis of the light bulb and lying in a plane transverse to said axis, said support pins being crank shaped and each of said intermediate members being attached to a respective one of said support pins.

4,292,565

SHADOW MASK ASSEMBLY FOR A CATHODE RAY TUBE

Masaharu Kanto, Hyogo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 19, 1979, Ser. No. 31,600

Int. Cl.³ H01J *29/07*

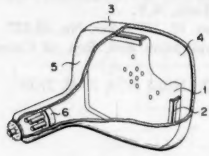
U.S. Cl. 313—407 **3 Claims**

1. A shadow mask assembly for a cathode ray tube, comprising:

a shadow mask made of steel; and

a mask frame made of steel;

at least one of said shadow mask and mask frame having a diffusion layer including nickel and iron and a black oxide



layer including mainly iron oxide, the oxide layer being formed on the diffusion layer.

4,292,566

TRAVELING WAVE TUBE WITH A HELICAL DELAY LINE

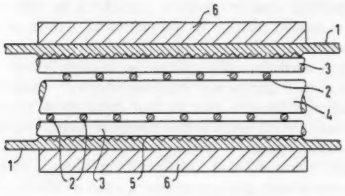
Hinrich Heynisch, Graefelfing; Erwin Huebner, and Heinz Barth, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 10, 1979, Ser. No. 65,733

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1978, 2840782

Int. Cl.³ H01J *25/34*

U.S. Cl. 315—3.5 **3 Claims**



1. A method for the manufacture of a traveling wave tube comprising the steps of placing a copper delay line onto an inner mandrel formed of a material having a greater coefficient of expansion than copper, assembling said delay line and a plurality of dielectric holding rods with a vacuum envelope, inserting the assembly into a tube formed of a material with a lower coefficient of expansion than copper; bringing the assembly to a temperature between 400° C. and 700° C.; exposing the assembly to a temperature of approximately 150° C. in dry air for approximately 90 minutes; exposing the assembly to a temperature of approximately 600° C. in dry nitrogen for approximately 10 minutes; and exposing the assembly to a temperature of approximately 600° C. in cracked gas or H_2 for approximately 15 minutes.

4,292,567

IN-BAND RESONANT LOSS IN TWT'S

Cliff D. Fritchle, Mountain View; Charles E. Hobrecht, Sunnyvale, and Allan W. Scott, Los Altos, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 28, 1979, Ser. No. 97,995

Int. Cl.³ H01J *25/34*

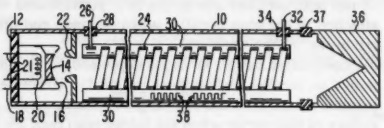
U.S. Cl. 315—3.5 **20 Claims**

1. A traveling wave tube having internal gain reduction comprising:

a helix-type slow-wave circuit for interaction with a linear electron beam over a selected band of frequencies, said interaction tending to produce a gain which varies with frequency over said band,

a dielectric rod near said circuit extending in the direction of the axis of said slow-wave circuit, and

resonant resistive conductor means attached to the surface



of said rod, the resonance bandwidth of said means including a substantial portion of said selected band,

whereby said gain varying with frequency is reduced internally over a substantial portion of said band.

4,292,568

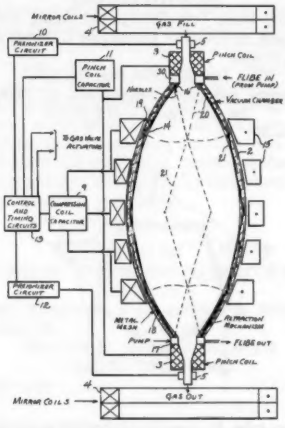
METHOD AND APPARATUS FOR HEATING AND COMPRESSING PLASMA

Daniel R. Wells, Miami, Fla., and Joseph J. Packo, Austin, Tex., assignors to Triosops, Inc., Austin, Tex.

Filed Mar. 16, 1979, Ser. No. 21,207

Int. Cl.² G21B *1/00*

U.S. Cl. 315—111.4 **11 Claims**



1. Apparatus for heating and compressing plasma comprising a vacuum chamber, means for generating a containment seed field in the chamber, means for generating plasma and confining said plasma in said vacuum chamber, means forming plasmoids in said chamber having a plasma configuration in which plasma mass flow in the chamber is predominantly along an axis extending in a direction parallel to said containment seed field, means for urging the plasmoids toward collision with each other, a collapsible molten metal liner in said chamber surrounding said plasmoids and means for collapsing said liner on the plasmoids after said collision with each other, to amplify said seed field and heat the plasmoids to thermonuclear temperature, and wherein said liner includes a flexible metal mesh sandwiched in the molten metal for stabilizing the liner during collapse.

4,292,569

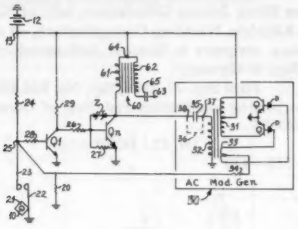
HIGH ENERGY MODULATION IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 923,828, Jul. 12, 1978, Pat. No. 4,216,412. This application Jun. 7, 1979, Ser. No. 46,569

Int. Cl.[3] H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R 16 Claims



1. An ignition system for a fuel burning engine including a timer for effecting first and second states of operation of said system, comprising the combination of:

alternating current modulation means having an output transformer with an output winding for providing alternating current from said output winding during the second state;

an ignition transformer with a single primary winding coupled in series to said output winding during the second state; and

electronic logic means, connected to said primary winding and controlled by said timer and coupled to said output winding, for enabling charging current to flow in the primary winding during the first state, for inhibiting said charging current and alternating current from flowing in said output winding during the first state, and for enabling said alternating current to flow in said output winding and primary winding so as to modulate discharge current of the primary winding during said second state.

4,292,570

ENERGY-CONSERVING ILLUMINATION SYSTEM

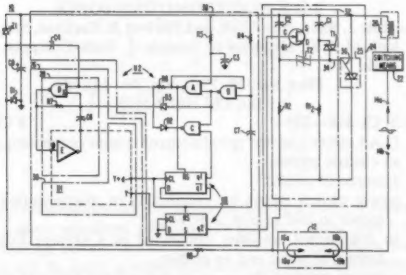
Joseph C. Engel, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 861,591, Dec. 12, 1977, Pat. No. 4,147,962. This application Mar. 28, 1979, Ser. No. 24,766

The portion of the term of this patent subsequent to Apr. 3, 1996, has been disclaimed.

Int. Cl.[3] H05B *41/38*

U.S. Cl. 315—360 6 Claims



1. An energy-conserving solid-state-controlled illumination system which operates lamp means at about a predetermined rated power consumption with a relatively high light output for a predetermined initial period of time during the initial night when a high degree of illumination is most needed and then operates said lamp means for a later period of the night at a reduced power which is a predetermined amount less than rated power consumption for a second predetermined period of time when a lower degree of illumination can be tolerated, and thereafter, if said lamp means is still energized according to the seasonal variations, operates said lamp means at said relatively high light output for the remainder of the night to accommodate early morning traffic, said system comprising:

a. input terminal means adapted to be connected to a source of electrical energy, and output terminal means adapted to be connected to the input terminals of said lamp means;

b. lamp ballasting means in circuit with said lamp means, said lamp ballasting means having a first operating mode in which the average power passed to said lamp means causes same to operate at about rated power consumption, and said lamp ballasting means having a second operating mode in which the average power passed to said lamp means is a predetermined amount less than the rated power consumption for said lamp means;

c. main switching means having an open state and a closed state, said switching means connected in circuit with said input terminal means and said lamp ballasting means to energize said lamp means when said switching means is in said closed state and to de-energize said lamp means when in said open state;

d. controlled switching means, the controlled closing and opening of which determines whether said ballasting means is in said first operating mode or said second operating mode;

e. timing means actuated by closing of said main switching means, said timing means when actuated, operating to generate a first time-related control signal after said initial predetermined period of time has elapsed, thereafter, said timing means continuing to operate to count down toward said second predetermined period of time, and if said timing means is still actuated by said main switching means remaining closed after said second predetermined period of time has elapsed, said timing means operating to generate a second time-related control signal, said first time-related control signal from said timing means is applied to said controlled switching means to switch said ballasting means from said first operating mode to said second operating mode, in the case said main switching means is still closed after said second predetermined period of time has elapsed, said second time-related control signal from said timing means is applied to said controlled switching means to switch said ballasting means from said second operating mode back to said first operating mode, said system continuing operation until said main switching means is opened, and said system is thereafter quiescent until said main switching means is again closed.

4,292,571

CONTROL DEVICE FOR CONTROLLING THE ROTATIONAL SPEED OF A PORTABLE POWER TOOL

Giuseppe Cuneo, Calolziocorte, Italy, assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 14, 1980, Ser. No. 121,538

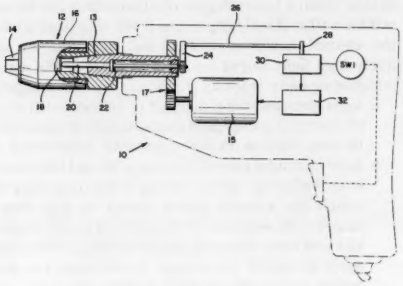
Int. Cl.[3] H02P *5/16*

U.S. Cl. 318—17 16 Claims

1. In a portable electric tool having an electric motor for driving an adjustable tool holder capable of receiving and accommodating various diameter tools, the improvement comprising:

sensor means operatively connected to said tool holder for

sensing the diameter of the tool secured in said tool holder; and,



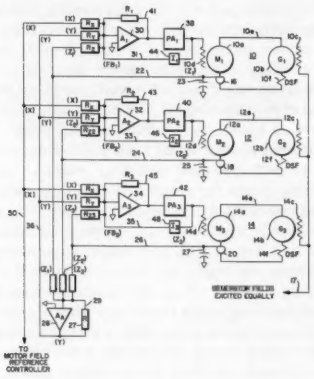
speed control means operatively connected to said sensor means for controlling the speed of said motor in accordance with the sensed diameter of said tool.

4,292,572

METHOD AND APPARATUS FOR REGULATING ELECTRIC MOTOR ARMATURE CURRENTS

Joel G. Ivy, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 26, 1979, Ser. No. 60,761
Int. Cl.³ B61C *15/08*
U.S. Cl. 318—52 **8 Claims**



5. Apparatus for regulating the armature currents of a plurality of electric motors driving a common load and each motor having a separate source of excitation, comprising:

sensing means for detecting the values of the armature currents of each motor and for producing output signals having values, respectively, proportional thereto,

averaging means for receiving said sensing means output signals and for producing therefrom an output signal having a value proportional to the average of the values of said sensing means output signals, and

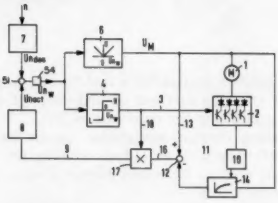
a plurality of regulating circuit means, one of which is coupled to provide varying excitation to each said motor, each said regulating circuit means including means for receiving and comparing the sensing means output signal for the motor associated therewith with said averaging means output signal and for producing a difference signal having a value proportional to the result of the comparison, the value of said difference signal thereby controlling the armature current of the motor connected to the regulating circuit means.

4,292,573

REVERSIBLE DIRECT CURRENT MOTOR WITH A PERMANENT MAGNET ROTOR AND ELECTRONIC COMMUTATING DEVICE

Hermann Ebert; Johann Grüntleitner, both of Nuremberg, and Hans Kühnlein, Nürnberg-Grossgründlach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 27, 1978, Ser. No. 946,106
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1977, 2743695
Int. Cl.³ H02P *6/02*
U.S. Cl. 318—138 **5 Claims**



1. In a reversible direct current motor with a permanent magnet rotor and electronic commutating device, in which the polarity of the desired speed voltage of a speed control device and the commutating sequence of the commutating transistors, which apply a motor voltage specified by the speed control device to the stator windings, are reversed for reversing the direction of rotation in response to a change in a direction of rotation signal, initiated by the speed control device, to a selection circuit, the improvement comprising:

(a) means to sense the motor voltage;

(b) means to subtract the motor I×R factor from the sensed motor voltage to develop a voltage proportional to the motor CEMF.

(c) means of feed said voltage proportional to CEMF to the motor controller; and

(d) means to reverse the polarity of said voltage proportional to the CEMF in the event of a change of the direction of rotation signal.

4,292,574

PERSONAL AIR SAMPLER WITH ELECTRIC MOTOR DRIVEN BY INTERMITTENT FULL-POWER PULSES UNDER CONTROL, BETWEEN PULSES, OF MOTOR'S BACK ELECTROMOTIVE FORCE

Anatole J. Sipin, New York, and Herbert R. Carleton, Setauket, both of N.Y., assignors to Anatole J. Sipin Company, New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,687
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—331 **8 Claims**

1. An electric motor speed control system comprising:

an electric motor;

a source of power;

power switch means for connecting or disconnecting said motor to said source of power;

an operational amplifier connected as a voltage follower having an input and an output;

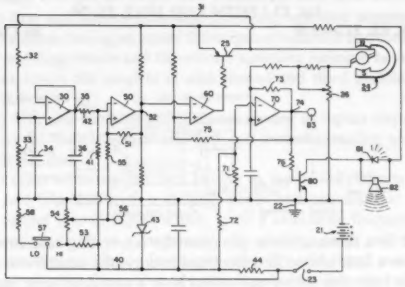
means to connect the input of said voltage follower to said motor to sense the voltage applied thereto while said power switch means connects said motor to said source of power and to sense the internal back electromotive force thereof while said power switch means disconnects said motor from said source of power and said electric motor is coasting;

said voltage follower operating as a linear amplifier rendered inoperative when sensing the larger voltage existing while said electric motor is connected to said source of power;

a capacitive storage device connected to the output of said operational amplifier;

resistive means for slowly charging said capacitive storage device while said voltage follower is inoperative to;

a level corresponding to increasing motor speed;



whereby, when said motor is disconnected from said source of power, the charge on said capacitive storage device varies directly in one direction with the decreasing speed of said electric motor while coasting; and

whereby, when said electric motor is connected to said source of power, the charge on said capacitive storage device receives current through said resistive means.

4,292,575

CONTROL SIGNAL TRANSMITTER FOR THE COMMUTATING DEVICE OF AN ELECTRONICALLY COMMUTATED D-C MOTOR

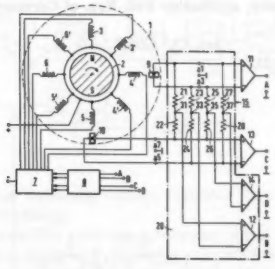
Hans Kühnlein; Hans Grüntleitner, and Hermann Ebert, all of Nürnberg-Grossgründlach, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 105,963

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 2900541

Int. Cl.³ H02P *6/02*

U.S. Cl. 318—254 **9 Claims**



1. In a commutatorless d-c motor including a rotor, a stator with 4n stator windings, where n is an integer greater than 1, a commutating device including 4n switching transistors for driving said 4n stator windings and a control signal transmitter for providing switching signals to said commutating device, an improved control signal transmitter for developing 4n switching signals with only n rotor position transmitters comprising:

(a) n rotor position transmitters which deliver electrical output signals which depend on the position of the rotor and change in time continuously when the rotor is rotated steadily, said rotor position transmitters spaced 180/n° el from each other;

(b) an evaluation circuit including:

(i) 2n operational amplifiers wired to provide switching outputs;

(ii) means coupling the inputs of each operational amplifier to said rotor position transmitters, said operational amplifiers providing as outputs 2n sequential signals equally spaced in time; and

(iii) means developing, from said 2n signals, 4n sequential individual switching signals for driving said 4n switching transistors in said commutating device.

4,292,576

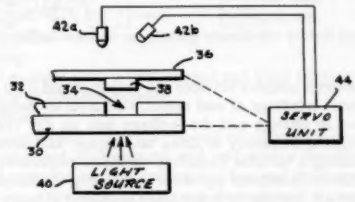
MASK-SLICE ALIGNMENT METHOD

Roderick K. Watts, Summit, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 29, 1980, Ser. No. 126,072

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—640 **10 Claims**



1. The method of aligning a mask on a semiconductor slice comprising the steps of:

forming a light transmissive pattern on a semiconductor slice,

forming a matching opaque pattern on a mask,

positioning said mask above said semiconductor slice with the matching patterns in approximate alignment,

illuminating the bottom of said semiconductor slice with light signals,

passing said light signals through said light transmissive pattern, and,

placing said mask on said semiconductor slice and moving said mask to minimize the amount of said light signals that passes through said mask.

4,292,577

A.C. MOTOR CONTROL CIRCUIT

Michael R. Cesarz, Mequon, and Richard E. Stobbe, Greenfield, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Mar. 12, 1979, Ser. No. 19,936

Int. Cl.³ H02P *5/28, 5/34*

U.S. Cl. 318—802 **16 Claims**

1. An a.c. motor control circuit comprising:

an a.c. motor having a plurality of stator windings and a rotor;

a tachometer coupled to said rotor and operable to produce an output signal proportional to the speed of said rotor;

means for generating a velocity command signal having an amplitude proportional to a desired speed for said motor;

means for comparing the output signal of said tachometer to said velocity command signal and for generating an error signal proportional to the difference between said tachometer output signal and said velocity command signal;

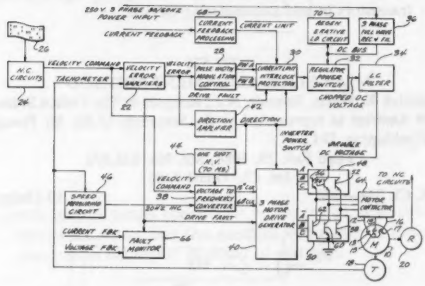
a d.c. power source;

a first switching circuit coupled to the output of said d.c. power source;

modulator means coupled to said first switching circuit and responsive to said error signal for periodically opening and closing said first switching circuit to cause said first

switching circuit to produce a train of d.c. pulses having a substantially fixed frequency and having a variable pulse width which is proportional at any time to the amplitude of said error signal;

a filter coupled to the output of said first switching circuit for filtering said train of d.c. pulses to produce a d.c. voltage which is substantially proportional to the amplitude of said error signal;



an inverter coupled between the output of said filter and the stator windings of said motor, said inverter being operative to change said d.c. voltage into an a.c. voltage of variable frequency to drive said motor, said inverter including a variable frequency oscillator responsive to said velocity command signal for controlling the frequency of said a.c. voltage in accordance with said velocity signal.

4,292,578

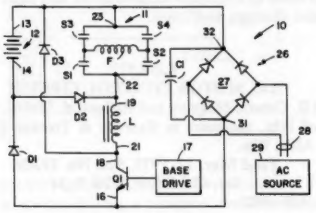
COMBINATION FIELD CHOPPER AND BATTERY CHARGER

Robert L. Steigerwald, Scotia, N.Y.; Keith E. Crouch, Pittsfield, Mass., and James W. A. Wilson, Scotia, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washingon, D.C.

Filed Aug. 13, 1979, Ser. No. 65,772

Int. Cl.³ H02J *7/06, 7/34*

U.S. Cl. 320—9 **10 Claims**



1. A combination field chopper and battery charger comprising:

a battery,

an electronic switch,

a field unit having a series connected field coil and field switch,

a rectifier unit having an a-c input and a d-c output,

first and second diodes,

circuit means for connecting said battery, said field unit, said electronic switch and said first diode in series with each other to form a first unidirectional current flow path therethrough and for connecting together said d-c output of said rectifier unit, said battery, said second diode and said electronic switch in series with each other to form a second uni-directional flow path therethrough, with the direction of the first and second flow paths through said electronic switch being the same and with the direction of the first and second flow paths through said battery being opposite to each other.

4,292,579

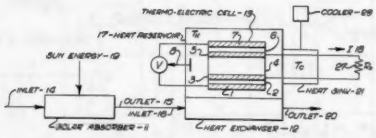
THERMOELECTRIC GENERATOR

James N. Constant, 1603 Danbury Dr., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 834,452, Sep. 19, 1977, abandoned. This application Oct. 23, 1978, Ser. No. 953,550

Int. Cl.³ H02N *3/00;* **H01L** *35/28*

U.S. Cl. 322—2 R **36 Claims**



1. In a thermoelectric generator for converting heat directly from a heat source into electrical energy, the combinatin of:

at least one active cell comprising a semiconductor means sandwiched between a pair of metal electrodes;

means including a heat source for heating at least portions of said cell;

means including one of a voltage or current source for applying an external electromotive force (emf) to said semiconductor means, said emf producing the drifting of charges and thereby producing a current in said semiconductor means, said drifting of charges being along a path one of smaller or greater than the mean free path of charges, said source being substantially decoupled from said current in said semiconductor means; and

means for connecting an external load across said metal electrodes for receiving the current generated by said semiconductor means.

4,292,580

CIRCUIT ARRANGEMENT FOR ATTENUATION OF POWER OSCILLATIONS IN NETWORKS

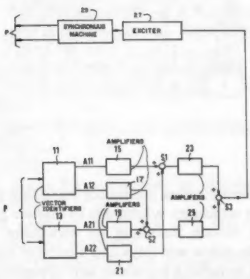
Günther Ott, and Wolfgang Kaufhold, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 98,896

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851871

Int. Cl.³ G05F *5/00*

U.S. Cl. 323—212 **3 Claims**



1. A circuit arrangement for supplying a signal to the exciter of at least one synchronous machine in order to attenuate power oscillations in a network to which the synchronous machine is coupled comprising:

(a) first and second vector identifiers having as an input detected power oscillations in the system, each vector identifier providing a direct and a phase-shifted output, each designed for a different frequency;

(b) first, second, third and fourth matching means receiving as inputs respectively, the direct output of said first vector identifier, the phase-shifted output of said first vector identifier, the direct output of said second vector identifier and the phase-shifted output of said second vector identifier;

(c) first and second summing junctions, said first summing junction having as inputs the output of said first and fourth matching means and the second summing junction having as inputs the outputs of said second and third matching means;

(d) fifth and sixth matching means having as inputs respectively, the outputs of said first and second summing junctions; and

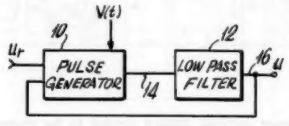
(e) third summing junction having as inputs the outputs of said fifth and sixth matching means and providing at its output a total signal which, over a selectable frequency range, varies in a mathematically positive sense with increasing oscillation frequency whereby said signal can be supplied to the exciter of a synchronous machine in order to damp power oscillations in the network.

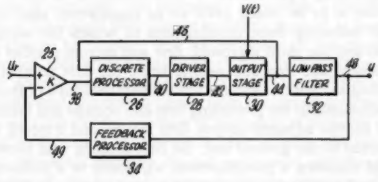
4,292,581

LINEAR SWITCHING REGULATOR

Tat S. Tan, P.O. Box 24, Mt. Marion, N.Y. 12456

Filed Jul. 13, 1979, Ser. No. 57,353
Int. Cl.³ H02P *13/32*
U.S. Cl. 323—283 **28 Claims**





1. A linear switching voltage regulator for regulating line voltage comprising:

a linear amplifier receiving a reference signal and an output feedback signal and producing an overall feedback signal;

discrete processor means for receiving said overall feedback signal as well as a high frequency feedback from its own output switching signal and for producing as its output switching signal a pulse strength modulation signal;

output means for turning on and off the line voltage by means of said switching signal to produce an intermediate output signal, and

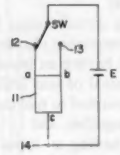
filter means filtering said intermediate output signal to produce a voltage regulated output signal, said output feedback signal being derived from said voltage regulated output signal.

4,292,582

RESIDUAL VOLTAGE REGULATING CIRCUIT FOR HALL ELEMENT

Mitsuaki Hino, Tokyo, Japan, assignor to Nippon Klingage Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1978, Ser. No. 914,983
Claims priority, application Japan, Jun. 22, 1977, 52/74000; Nov. 22, 1977, 52/140413; Dec. 12, 1977, 52/166790[U]; Dec. 12, 1977, 52/166791[U]
Int. Cl.³ G05F *7/00*
U.S. Cl. 323—294 **9 Claims**



1. A residual voltage regulating circuit for a Hall element comprising:

a Hall element having first, second and third terminals;

a source of constant-current;

an oscillator;

switching means, responsive to said oscillator, for interconnecting said Hall element and said source for directing said constant-current through said first and third terminals during a first time period, and through said second and third terminals during a second time period;

measuring means, connected to said first, second and third terminals and responsive to said switching means, for measuring the voltage across said second and third terminals during said first time period and for measuring the voltage across said first and third terminals during said second time period, said measuring means including a high input impedance amplifier; and

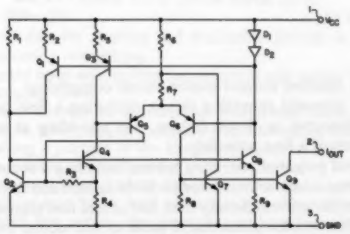
means, attached to said measuring means, for subtracting the voltage measured during said first time period from the voltage measured during said second time period so that the even effects of a magnetic field applied to said Hall element are cancelled, and said subtracting means produces a signal related only to the Hall voltage of said Hall element.

4,292,583

VOLTAGE AND TEMPERATURE STABILIZED CONSTANT CURRENT SOURCE CIRCUIT

Werner H. Hoeft, Santa Clara County, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jan. 31, 1980, Ser. No. 117,118
Int. Cl.³ G05F *1/56*
U.S. Cl. 323—316 **8 Claims**



1. A voltage and temperature stabilized constant current

source circuit having power supply and ground terminals, which comprises:

differential amplifier circuit means having first and second input terminals, first and second output terminals and a current supply terminal;

voltage reference circuit means for providing a reference voltage to the first input terminal of said differential amplifier;

voltage stabilizing circuit means for compensating for changes in the voltage applied to said power supply terminal and having an input terminal coupled to said second output terminal of the differential amplifier and an output terminal coupled to said second input terminal of the differential amplifier;

temperature stabilizing circuit means for compensating for changes in circuit component characteristics with temperature variations and having an input terminal coupled to the first output terminal of said differential amplifier and an output terminal coupled to said current supply terminal of the differential amplifier; and

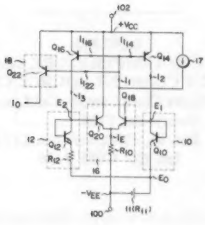
output circuit means having an input terminal coupled to said first output terminal of the differential amplifier and an output terminal for providing a stabilized constant current output signal.

4,292,584

CONSTANT CURRENT SOURCE

Hiromi Kusakabe, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 4, 1979, Ser. No. 45,335
Claims priority, application Japan, Jun. 9, 1978, 53-69532
Int. Cl.³ G05F *3/20*
U.S. Cl. 323—316 **16 Claims**



1. A constant current source circuit comprising:

first potential providing means, including a first transistor connected in diode fashion, for providing at one end thereof a first potential;

second potential providing means, including a second transistor which is connected in diode fashion and has a lower emitter current density than that of said first transistor and a first resistor connected in series to said second transistor, for providing at one end a second potential;

comparing means for comparing the first and second potentials and providing a first current corresponding to a potential difference between these potentials;

a third transistor for providing at the collector circuit thereof a second current, corresponding to the first current, said second current being provided to said first potential providing means;

a fourth transistor for providing at the collector circuit thereof a third current corresponding to the first current said third current being provided to said second potential providing means; and

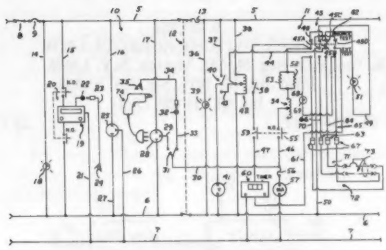
current supply means for supplying a constant current output corresponding to the first current.

4,292,585

LEAKAGE CURRENT TESTING CIRCUIT

George F. Charette, 14 Skelton Rd., Burlingto, Mass. 01803

Filed Jan. 17, 1979, Ser. No. 4,322
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **6 Claims**



1. A leakage current testing circuit to be connected to an energized three wire outlet and for use where either the outlet is protected by a ground fault circuit interrupter device or such a device is to be tested prior to its installation, said testing circuit including three parallel lines of which the second is neutral and the third a ground, first and second parallel leads connecting said first and neutral lines, the first parallel lead including a voltmeter and the second parallel lead a potentiometer adjustable to the prevailing first line voltage and including a lead for the adjusted output, first and second tripping leads connected to the ground line, the first tripping lead including parallel resistors, a potentiometer adjustable in a milliampere range and a milliammeter, and the second tripping lead including a digital readout timer of a type latching its reading when the device being tested trips and a timer lead, first switch means in control of said tripping leads and operable to close them in the alternative or simultaneously, second switch means having first and second operative positions in the first of which the adjusted output lead is closed to said tripping leads and said timer lead is connected to said neutral line, the first position used when the circuit is protected by a ground fault circuit interrupter device to be tested and the second position used when an external test is to be made of such a device prior to its installation, and said circuit including an external test section provided with first and second outlets each of which includes first and second leads to which said device is to be connected, and when said second switch means is in its second position with the device to be tested connected to said leads, the adjusted output lead is closed to the external test section through the device and the tripping leads, and the timer lead closed

through the device to the neutral line, whereby in either position of the second switch means, device leakage can be measured in terms of milliamperes and then in terms of milliseconds at an established milliampere value.

4,292,586

TESTING OF CIRCUIT ARRANGEMENTS

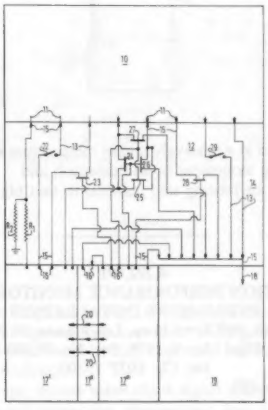
Donald A. Longmuir, Loanhead, and John M. Morrison, Edinburgh, both of Scotland, assignors to Ferranti Limited, Cheadle, England

Filed May 31, 1979, Ser. No. 44,311

Claims priority, application United Kingdom, May 31, 1978, 25470/78

Int. Cl.³ G01R *15/12*

U.S. Cl. 324—73 R **14 Claims**



1. Apparatus comprising a circuit arrangement having a plurality of terminals, test equipment to provide a plurality of different test signals from output terminals thereof, at least one test signal to be supplied in a test sequence to the circuit arrangement, indicating means to receive output signals from the circuit arrangement in response to the test sequence from the test equipment, the output signals from the circuit arrangement being indicative of the manners of operation of the parts of the circuit arrangement to receive the test signals, and interface means connected between the test equipment and the circuit arrangement, the interface means including a pattern of conductors and connector parts mounted upon a substrate of electrical insulating material, the connector parts cooperating with the terminals of the circuit arrangement and the output terminals of the test equipment, to complete electrical connections between the circuit arrangement and the test equipment through the interface means, and the interface means including at least one electrical component arranged to modify in a required manner at least one of the test signals before it is supplied to the circuit arrangement.

4,292,587

Patent Not Issued For This Number

4,292,588

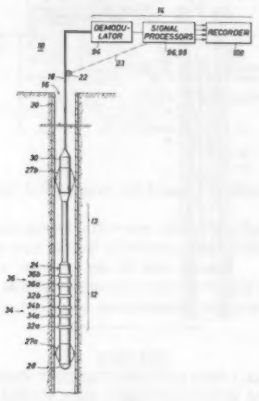
ELECTROMAGNETIC INSPECTION TOOL FOR FERROMAGNETIC CASINGS

Glenn S. Smith, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Dec. 18, 1978, Ser. No. 970,671

Int. Cl.³ G01N *27/72, 27/82*; G01R *33/12*

U.S. Cl. 324—221 **22 Claims**



1. In an electromagnetic thickness measuring tool having means for generating a thickness signal indicative of the thickness of a ferromagnetic casing, and means for generating a permeability signal indicative of the permeability of the casing the improvement comprisng:

means for generating a corrected permeability signal corrected for the variations of inside diameter of the casing and

means for generating a corrected thickness signal corrected for the variations of permeability of the casing.

4,292,589

EDDY CURRENT METHOD AND APPARATUS FOR INSPECTING FERROMAGNETIC TUBULAR MEMBERS

Stephen D. Bonner, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed May 9, 1979, Ser. No. 37,423

Int. Cl.³ G01N *27/72, 27/82*; G01R *33/12*

U.S. Cl. 324—221 **32 Claims**

1. Apparatus for locating and evaluating defects in ferromagnetic casing comprising:

an elongated body adapted for suspension in said casing from a well logging cable;

first means, adapted to be disposed within said casing, and located on said body, for generating an alternating magnetic field along a portion of the longitudinal axis of said casing which induces circumferential currents therein;

second means, adapted to be disposed within said casing and located on said body, said second means disposed axially from said first means, for generating at least one signal in response to perturbations of said circumferential current in said casing, said second means including:

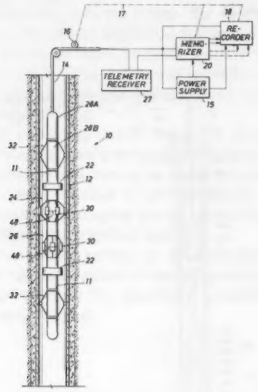
a carrying member,

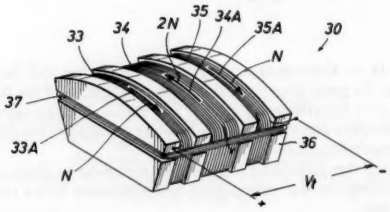
a first coil having N number of windings supported by said carrying member,

a second coil disposed adjacent said first coil and having 2 N number of windings serially opposed to the windings of said first coil, and

a third coil disposed adjacent said second coil and having N number of windings serially opposed to the windings of said second coil; and

a signal processor coupled to said second means for receiving at least one of said signals for measuring the amplitude and phase components thereof, thereby determining the characteristics of said defect.





4,292,590

MAGNETOMETER APPARATUS WITH DETECTOR IMMOBILIZED IN WAX

James H. Wilson, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1979, Ser. No. 93,329

Int. Cl.[3] **G01R** *33/02;* **C01G** *21/16;* **B65B** *23/00;* **H02G** *13/08*

U.S. Cl. 324—226 **7 Claims**

1. A magnetometer assembly comprising:

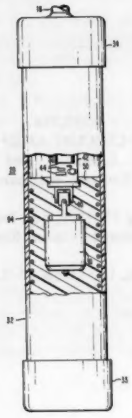
(a) a housing;

(b) a magnetometer detector disposed within said housing to sense external magnetic disturbances;

(c) support means for supporting said detector and being of the type which allows said detector to swing freely so as to assume a vertical orientation;

(d) said detector being suspended in a material which is a solid at the normal operating temperature of said detector so as to prevent swinging movement of said detector but is a liquid at a relatively higher temperature so as to allow swinging movement of said detector; and

(e) means for heating said material to said higher temperature.



4,292,591

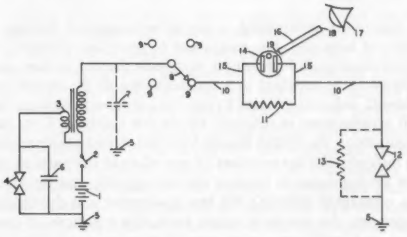
IGNITION PERFORMANCE MONITOR FOR PERMANENT INSTALLATION

James D. Doss, 905 Tewa Loop, Los Alamos, N. Mex. 87544

Filed May 9, 1979, Ser. No. 37,330

Int. Cl.[3] **F02P** *17/00*

U.S. Cl. 324—395 **5 Claims**



1. A device which may be permanently installed for visually monitoring the performance of electrical ignition systems which are used in the operation of internal combustion engines, wherein parasitic system capacitance is that electrical capacitance which exists between the ignition system high voltage terminal and the ignition system ground connection to the engine, comprising:

a composite current sensor which is a combination of two components connected electrically in parallel; the first component being an electrical resistance element and the second component being a gaseous discharge device consisting essentially of two electrically conductive electrodes which are separated within a region containing a gas or mixture of gases which will ionize and emit visible light when electric current flow resulting from a dis-

charge of parasitic system capacitance through said parallel resistance element causes a sufficient electric potential to be developed between the said two electrodes to cause ionization of said gaseous discharge device, and

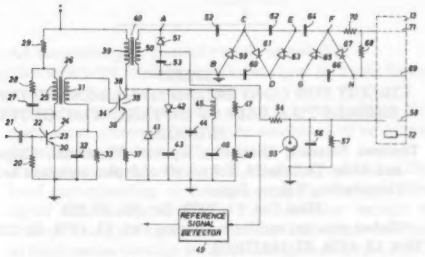
electrical connection of said composite current sensor comprising said resistance element and said gaseous discharge device in series with an electrical conductor which is used to provide a path for electrical current flow between a source of high voltage and a spark plug high voltage terminal wherein said spark plug is used in an electric ignition system which is incorporated into an internal combustion engine.

4,292,592

PULSED POWER SUPPLY SYSTEM

James A. Birdwell, and Joseph M. Delasko, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 29, 1979, Ser. No. 43,866
Int. Cl.³ H05H *5/00*; G21G *4/02*
U.S. Cl. 328—233 **4 Claims**



1. A circuit for pulsing a high voltage ion source in an accelerator tube having an anode, a cathode and a grid, comprising:

a step-up transformer having a primary winding and a secondary winding;

a low voltage, square wave clock signal source;

first transistor means for shaping said low voltage clock signal;

second transistor means responsive to said shaped low voltage clock signal for inducing voltages within said primary winding of said transformer;

a voltage multiplier circuit coupled to said secondary winding of said transformer for supplying first and second voltage potential to said anode and said cathode of said accelerator tube; and

a voltage regulator circuit coupled to said secondary winding of said transformer for producing a third voltage potential, said third voltage potential being coupled to said grid of said accelerator tube.

4,292,593

METHOD OF DEMODULATING A QUADPHASE CODED DATA SIGNAL AND RECEIVER FOR CARRYING OUT THE METHOD

Frank de Jager; Rudolf A. Van Doorn; Johannes J. Verboom, and Marino G. Carasso, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

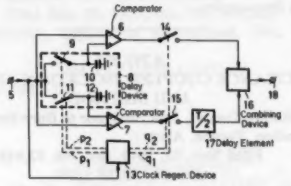
Filed Jun. 29, 1979, Ser. No. 53,577
Claims priority, application Netherlands, Mar. 26, 1979, 7902341
Int. Cl.³ H03K *13/01*
U.S. Cl. 329—50 **6 Claims**

1. A method of demodulating a quadphase coded data signal which comprises data words consisting of first, second, third and fourth equally long, consecutive half-bit intervals, said method comprising the steps of:

sampling said data words in each of said half-bit intervals forming separate sampling values;

synchronously comparing, bit and word, the sampling value in the third half-bit interval with the sampling value in the first half-bit interval forming a first difference value;

synchronously comparing, bit and word, the sampling value in the fourth half-bit interval with the sampling value in



the second half-bit interval forming a second difference value;

delaying said second difference value for a half-bit interval such that said second difference value follows said first difference value by one bit interval; and

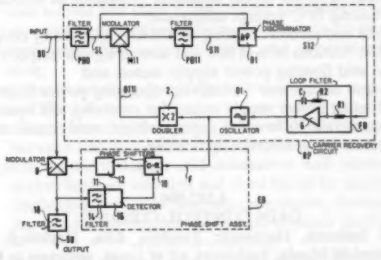
combining said first difference value with said second difference value to form a demodulated data word.

4,292,594

METHOD AND APPARATUS FOR CARRIER REGENERATION AND SYNCHRONOUS AMPLITUDE DEMODULATION

Jacques David, Lannion, and Hubert Mionet, Perros-Guirec, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Aug. 21, 1979, Ser. No. 68,439
Claims priority, application France, Aug. 30, 1978, 78 24994
Int. Cl.³ H03D *1/00*
U.S. Cl. 329—50 **15 Claims**



1. A method of recovering the modulation carrier wave of a modulated signal whose frequency spectrum includes components whose frequencies are symmetrical in pairs about the carrier frequency, said method including the following operations:

generating a local carrier (F) at a controllable frequency;

deriving, where necessary, an "original" signal (SL) from the said modulated signal, such that the frequency spectrum of the original signal is constituted substantially entirely by a frequency component at the carrier frequency and modulation components arranged symmetrically in pairs about the carrier frequency;

using the local carrier in conjunction with modulation means and filtering means to generate two image signals from the "original" signal such that the frequency spectrum of one of the image signals is inverted about its central frequency with respect to the frequency spectrum of the other of the

image signals, and such that the frequency difference between the central frequencies of the image signals is proportional to the frequency difference between the frequency of the local carrier and the frequency of the modulation carrier;

performing a step of phase discrimination between the said image signals; and

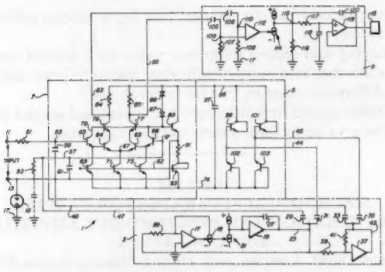
controlling the frequency of the local carrier by the signal which results from the discrimination after removal of the high frequencies.

4,292,595

CAPACITANCE COUPLED ISOLATION AMPLIFIER AND METHOD

Lewis R. Smith, Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Nov. 13, 1979, Ser. No. 93,918
Int. Cl.³ H03F 3/38
U.S. Cl. 330—10 **16 Claims**



1. An isolation amplifier for producing an isolated output signal in response to a differential input signal, said isolation amplifier comprising in combination:

a. first means for producing first and second signals each having a triangular wave shape, said first and second signals being substantially complementary;

b. floating power supply means for producing an electrically floating D C voltage difference;

c. first and second coupling means for capacitively coupling first portions of said first and second signals, respectively, to said floating power supply means; and

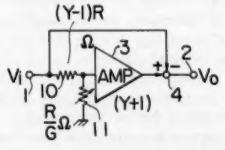
d. input circuit means receiving operating power from said floating power supply means for receiving and operating upon said differential input voltage, said input circuit means being electrically floating.

4,292,596

GAIN CONTROL CIRCUIT

Kohei Ishizuka, Hachiouji; Yasuhiro Kita, Hachiouji, and Narimichi Maeda, Tachikawt, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 13, 1979, Ser. No. 66,239
Claims priority, application Japan, Aug. 11, 1978, 53-97209
Int. Cl.³ H03G 3/00
U.S. Cl. 330—86 **9 Claims**



1. A digital gain control circuit having (a) an input terminal and an output terminal; (b) an amplifier connected between said input and output terminals; and (c) a resistance network which includes a variable resistance circuit disposed between one of said terminals and said amplifier, said variable resistance circuit comprising a plurality of resistance elements and switch means including a plurality of switches for changing-over said resistance elements, said variable resistance circuit including circuit means for driving said plurality of switches directly with digital code signals, said amplifier and said resistance network being such that the transfer function between said input and output terminals is:

$$\frac{\frac{Y+1}{Y-1}+(AG+B)}{\frac{Y+1}{Y-1}-(AG+B)}$$

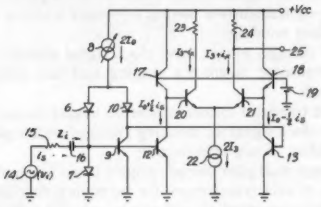
where Y denotes a constant which determines the gain of said amplifier and/or a value of the constituent resistance of said resistance network, G denotes a coefficient which varies in direct proportion to the digital code signal, and A and B denote constants.

4,292,597

CIRCUIT FOR CONVERTING SINGLE-ENDED INPUT SIGNALS TO A PAIR OF DIFFERENTIAL OUTPUT SIGNALS

Tsutomu Niimura, Hiratsuka; Kyoichi Murakami, Chigasaki, and Akira Yamakoshi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 11, 1979, Ser. No. 83,858
Claims priority, application Japan, Oct. 13, 1978, 53/126532; Oct. 13, 1978, 53/141273[U]
Int. Cl.³ H03F 3/45; H03G 3/30
U.S. Cl. 330—254 **16 Claims**

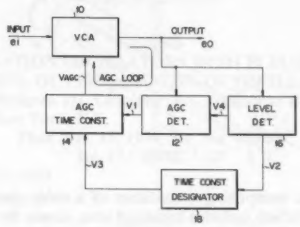


1. A circuit for converting a single-ended input signal to a pair of differential output signals, comprised of first and second diode means connected in a first series circuit; third diode means; transistor means having its collector-emitter circuit connected in a second series circuit with said third diode means, the first series circuit formed of said first and second diode means being connected in parallel with the second series circuit formed of said third diode means and the collector-emitter circuit of said transistor means; said transistor means having its base electrode connected to the junction defined by said first and second diode means such that the base-emitter circuit thereof is in parallel arrangement with said second diode means; current source means connected to the parallel-connected first and second series circuits so as to supply currents thereto; means for supplying a signal current to said junction defined by said first and second diode means; and first and second output means coupled to said junction defined by said first and second diode means and to the collector electrode of said transistor means, respectively, for providing a pair of differential output signal currents to flow therethrough that are a function of said supplied signal current.

4,292,598
AUTOMATIC GAIN CONTROL CIRCUIT

Hiroto Yasumura, Kumagaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 25, 1979, Ser. No. 42,345
Claims priority, application Japan, Jun. 1, 1978, 53-66077; Feb. 15, 1979, 54-15453; Feb. 15, 1979, 54-15454; Feb. 15, 1979, 54-15455
Int. Cl.³ H03G 3/20
U.S. Cl. 330—281 18 Claims

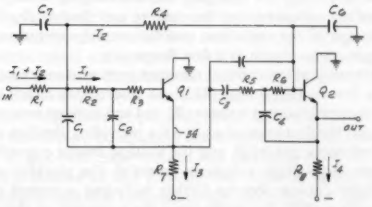


1. An automatic gain control circuit comprising:
(a) first means for amplifying an input signal by a gain factor controlled by a control signal;
(b) second means for providing a first signal including a DC component corresponding to the amplitude of an output signal derived from said first means;
(c) third means for providing said control signal with a DC level corresponding to the DC component of said first signal and having a variable time constant enough to remove the ripple component of the first signal, said first to third means forming an automatic gain control (AGC) loop;
(d) fourth means for providing a second signal when the amplitude of said input signal or said output signal reaches a given value; and
(e) fifth means for providing a third signal to designate the changing of the time constant of said third means when receiving said second signal, said time constant of said third means increasing to a predetermined value only in response to said third signal.

4,292,599
LOW PASS ACTIVE FILTER

Stephen M. Bench, Huntington Beach, Calif., assignor to The Anaconda Company, New York, N.Y.

Filed Jan. 19, 1979, Ser. No. 4,707
Int. Cl.² H03F 3/04
U.S. Cl. 330—290 8 Claims

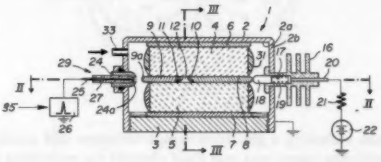


1. In a low pass filter, the combination comprising
(a) multiple stages including multiple active devices,
(b) circuitry including resistance and capacitance providing AC coupling of the stages in series sequence, successive stages being DC isolated, and
(c) high impedance biasing resistance coupled between the first and last stage inputs, whereby the DC operating point is determined by one active device.

4,292,600
PULSED GAS LASER EMITTING HIGH-POWER BEAM OF SHORT WAVELENGTH

Arnold Neracher, Geneva, Switzerland, assignor to Battelle Memorial Institute, Geneva, Switzerland

Filed Jun. 21, 1977, Ser. No. 808,525
Claims priority, application Switzerland, Jun. 23, 1976, 8009/76
Int. Cl.³ H01S 3/097
U.S. Cl. 331—94.5 G 12 Claims



1. A laser comprising:
a pair of flat nonconductive bodies separated by a narrow interspace, at least one of said bodies being a member with two parallel major faces composed of a solid material having a high dielectric constant;
a housing disposed around said bodies and provided with a radiation-transparent window, said housing having a conductive wall portion in full-face contact with a first metallic layer on a major face of said member remote from said interspace;
a second metallic layer in said interspace overlying part of the opposite major face of said member and defining a storage capacitance with said first layer;
a third metallic layer coplanar with said second layer in said interspace overlying another part of said opposite face and defining a pulse-shaping capacitance with said first layer, said second and third layers having substantially rectilinear confronting edges defining an elongate cavity in said interspace; said cavity having an end adjacent said window;
impedance means galvanically interconnecting said second and third layers;
terminal means for connecting a source of charging voltage between said first and second layers; and
circuit means including said conductive wall portion connected between said first and third layers for periodically discharging said pulse-shaping capacitance, thereby exciting a radiation-emitting gas in said elongate cavity.

4,292,601
FLASHLAMP EXCITED FLUID LASER AMPLIFIER

Henry R. Aldag, Boston, Mass.; John B. Marling, Pleasanton, Calif., and Charles T. Pike, Lexington, Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

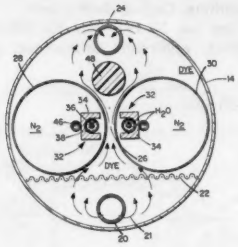
Continuation of Ser. No. 810,952, Jun. 29, 1977, abandoned.
This application Apr. 7, 1978, Ser. No. 894,416
Int. Cl.² H01S 3/093
U.S. Cl. 331—94.5 L 14 Claims

1. Apparatus for exciting a fluid laser medium comprising:
first and second confronting walls disposed parallel to each other to define a fluid channel for the flow of the fluid laser medium between said confronting walls;
said confronting walls including optically transmissive portions along the length of said fluid channel transverse to the fluid flow;
means adjacent the optically transmissive portions of said confronting walls for applying optical excitation to said

fluid channel from a location behind said confronting walls;

means associated with said excitation applying means for providing cooling thereof;

the laser medium being forced through said fluid channel; and



means including a gas filled region between said excitation applying means and said fluid channel for providing thermal isolation between said excitation applying means and said fluid channel whereby heat transfer between said excitation means and said fluid channel is reduced.

4,292,602

LASER RESONATOR

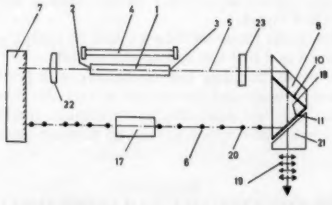
Erik Bergqvist, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Sweden

Filed Apr. 17, 1978, Ser. No. 897,070

Claims priority, application Sweden, Apr. 28, 1977, 7704874

Int. Cl.³ H01S 3/02

U.S. Cl. 331—94.5 C **6 Claims**



1. A laser apparatus, comprising:

an optical resonant cavity of the folded type, said cavity having a first and a second end, both ends of said cavity being limited by the same totally reflecting mirror;

an active material arranged in said cavity;

means for exciting said active material to generate oscillating radiation moving between said ends in said cavity; and

a corner cube prism arranged between said ends in said cavity, said prism comprising a plurality of plane reflective surfaces which successively reflect said radiation so that reflected radiation is parallel to incident radiation, one of said reflective surfaces having disposed thereon a beam dividing polarizer means for separating the output beam of the laser from the radiation oscillating in said cavity.

4,292,603

EXCIPLEX LASERS

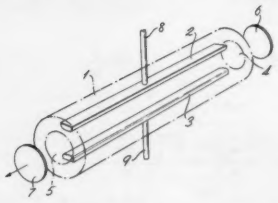
Marcus H. R. Hutchinson, Harrow, England, assignor to National Research Development Corporation, London, England

Filed Jun. 20, 1978, Ser. No. 917,358

Claims priority, application United Kingdom, Jun. 21, 1977, 25861/77

Int. Cl.³ H01S 3/22, 3/223

U.S. Cl. 331—94.5 G **8 Claims**



1. A laser comprising a container of a noble gas and of a compound which includes hydroxyl ions, means for pumping energy into the container so as to raise the noble gas to an excited state and allow the formation of a noble gas hydroxide exciplex and resonating means comprising a multiple reflection path which includes the container so as to enable the exciplex to emit a coherent beam of energy of a defined wavelength and thereupon disassociate into its constituents.

4,292,604

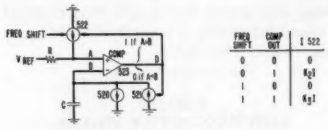
RELAXATION OSCILLATOR WITH PLURAL CONSTANT CURRENT SOURCES

Milton L. Embree; David C. Goldthorp, both of Reading, Pa., and David R. Vogelpohl, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 20, 1979, Ser. No. 67,717

Int. Cl.³ H03K 3/023, 3/282

U.S. Cl. 331—111 **5 Claims**



1. An oscillatory signal generator circuit comprising in combination:

a capacitor (C);

means (V_{ref}, R, **522**) for providing a first voltage reference potential and a second voltage reference potential for determining the charging and discharging voltage range of the capacitor, and for causing and discharging voltage range of the capacitor, and for causing operation of the generator circuit at a first frequency;

a plurality of interrelated constant current sources including a first current source (**522**) and wherein the means include in combination a resistor (R) and and voltage source (V_{ref}) and the first current source for providing the first voltage reference potential, and the voltage source providing the second voltage reference potential, the plurality of constant current sources further including a second current source (**520**) for discharging the capacitor to the second voltage reference potential and a third current source (**521**) for charging the capacitor to the first voltage reference potential; and

a comparison means (**523**) for comparing the voltage on the capacitor with the first and second voltage reference potentials, the comparison means providng an input signal to the first current source and to the third current source

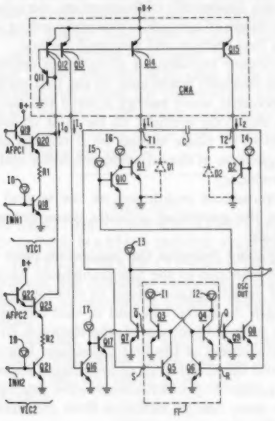
upon the capacitor voltage going outside of the voltage range defined by the first and second voltage reference potentials, the capacitor, the second current source and the third current source being commonly connected to a third reference potential and to a first input of the comparison means, a second input of the comparison means having the voltage source coupled thereto through the resistor, and one side of the first current source connected thereto, the other side of the first current source being connected to the third reference potential.

4,292,605

RELAXATION OSCILLATORS WITH ELECTRICAL CONTROL OF PERIODICITIES OF OSCILLATION

Robert L. Rodgers, III, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 94,752
Int. Cl.³ H03K *3/28*
U.S. Cl. 331—111 **4 Claims**



1. A relaxation oscillator with electrical control of the periodicity of its oscillations comprising:

a reference voltage bus;

a timing capacitor;

first and second terminals between which said timing capacitor is connected;

first and second electrically controlled constant current generators respectively supplying a first current to said first terminal and a second current proportional to said first current to said second terminal;

R-S flip-flop means set by the voltage at said first terminal departing in a first sense from said reference voltage by a predetermined amount and reset by the voltage at said second terminal departing in said first sense from said reference voltage by a predetermined amount;

first switching means responding to the set condition of said R-S flip-flop for completing connection of said first terminal to said reference voltage bus and responding to the reset condition of said R-S flip flop for interrupting connection of said first terminal to said reference voltage bus; and

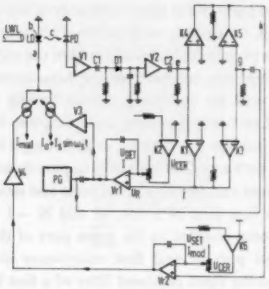
second switching means responding to the reset condition of said R-S flip-flop for completing connection of said second terminal to said reference voltage bus and responding to the set condition of said R-S flip-flop for interrupting connection of said second terminal to said reference voltage bus.

4,292,606

MODULATION CURRENT CONTROL OF LASER DIODES

Herwig Trimmel, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,155
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1978, 2847182
Int. Cl.³ H01S *3/096*
U.S. Cl. 332—7.51 **10 Claims**



1. A method to control the modulation current supplied to a laser diode, which is employed as a light transmitter in a transmission stage of a signal transmission system with a lightwave guide, and which has a light-current characteristic curve with two breakpoints, comprising the steps of:

supplying a bias current to the laser diode;

superimposing a selected pilot signal on bias current;

applying a modulation current to the laser diode such that the total current applied to the diode, for limited time intervals, exceeds the value of the current at the second breakpoint on the light-current characteristic curve;

sensing a portion of the light emitted by the laser diode;

converting the sensed portion of the light emitted by the laser diode into a corresponding electrical signal;

comparing the electrical signal to a reference signal;

forming a control signal from a selected portion of the output signal of the comparator;

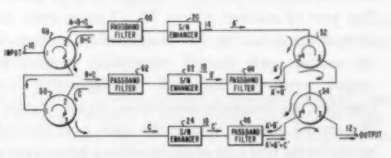
adjusting the value of the modulation current based on the value of the control signal.

4,292,607

BROADBAND CIRCUIT FOR MICROWAVE S/N ENHANCERS

Harry Goldie, Randallstown, and Steven N. Stitzer, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 19, 1980, Ser. No. 131,586
Int. Cl.³ H01P *5/00, 1/32*
U.S. Cl. 333—24.1 **5 Claims**



1. A microwave circuit network having an input and an output port and comprising N parallel branches which are operative, in combination, to enhance the signal-to-noise ratio

of an input signal over a predetermined frequency bandwidth, said network comprising:

a signal-to-noise enhancer of the magnetostatic wave excitation type utilizing ferrite material, disposed in each branch of said network, said predetermined operational frequency bandwidth of said network being comprised of N frequency sub-bands, each enhancer being adjustedly operative over a corresponding one of said frequency sub-bands exclusively;

an input passband microwave filter, disposed in each of a number of appropriate branches of said network and coupled to the input of the signal enhancer of the corresponding branch, for passing, with relatively low losses, signals having frequencies substantially within the adjusted operational frequency sub-band of the branch-related signal enhancer and for reflecting signals having frequencies outside of said corresponding frequency sub-band;

N −1 input microwave circuits, each having a first, second and third port and each operative to pass signals unidirectionally from said first to second ports and second to third ports, the first port of a first of said N −1 microwave circuits being coupled to the input port of the network, the second port of said first microwave circuit being coupled to the input passband filter of a first branch, and the third port thereof being coupled to the first port of another microwave circuit, each of the remaining N −2 microwave circuits having the second ports thereof coupled respectively to the input passband filters of corresponding network branches, the remaining microwave circuit coupled to the i^{th} network branch having the third port thereof connected to the first port of the remaining microwave circuit coupled to the (i +1)th network branch, the remaining third port of a final microwave circuit being coupled to the signal enhancer of a final network branch;

an output passband microwave filter disposed in each of a number of appropriate branches of said network and coupled to the output of the signal enhancer of the corresponding branch, each output passband filter being operative to pass, with relatively low losses, signals having frequencies substantially within the adjusted operating frequency sub-band of said coupled enhancer and to reflect signals having frequencies outside of said frequency sub-band; and

N −1 output microwave circuits each having a first, second and third port and each operative to pass signals unidirectionally from said first to second port and from said second to third ports, the first port of a first of said N −1 microwave circuits being coupled to the output of the enhancer disposed in a first branch of the network, the second port of said first microwave circuit being coupled to said output passband filter of a second branch of said network and the third port thereof being coupled to said first port of another of said N −1 microwave circuits, each of the remaining N −2 microwave circuits having the second ports thereof respectively coupled to said output passband filters of corresponding network branches, the remaining microwave circuit coupled to the i^{th} network branch having the third port thereof connected to the first port of the remaining microwave circuit coupled to the (i +1)th branch, the remaining third port of a final microwave circuit being coupled to the output port of the network.

4,292,608

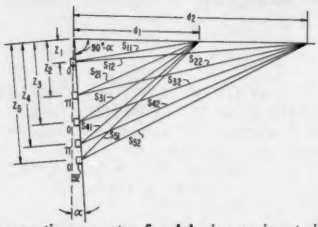
ELECTROACOUSTIC DELAY LINE APPARATUS

Robert W. Weinert, Monroeville, and John de Klerk, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 26, 1979, Ser. No. 61,089

Int. Cl.³ H03H *9/30, 9/40*

U.S. Cl. 333—141 **12 Claims**



1. In electroacoustic apparatus for delaying an input signal having a known bandwidth of frequencies, the combination of

a delay line made of acoustic wave propagating material and having a first surface and a second surface,

a first transducer including a plurality of series connected electrode elements positioned on the first surface for generating acoustic wave energy toward the second surface,

with each electrode element of the first transducer being energized to be phase shifted by π radians in relation to the energization of the adjacent electrode elements of the first transducer,

a second transducer positioned on the second surface for receiving the generated acoustic wave energy from the first surface,

with the spacing between the successive pairs of adjacent electrode elements of the first transducer having a predetermined variation determined in relation to the acoustic wavelength Λ_1 at the low end of said bandwidth of frequencies of said input signal, the distance Z_1 of the first electrode element of the first transducer from the second surface and the distance d_1 of the second transducer from the first surface to provide constructive interference in the acoustic wave energy radiation from the first transducer toward the second transducer.

4,292,609

RECURSIVE FILTER FOR TRANSFER OF CHARGE DEPOSITS

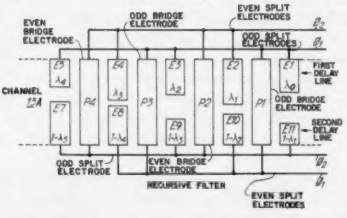
Michel Feldman, 45, rue Saint Lambert, 75015 Paris, and Jeannine Le Goff épouse Henaff, 3, ter Place Marquis, 92140 Clamart, both of France

Filed Jun. 13, 1979, Ser. No. 48,155

Claims priority, application France, Jun. 26, 1978, 78 19829; Feb. 21, 1979, 79 05108

Int. Cl.³ H03H *15/02, 17/04;* **G11C** *19/14*

U.S. Cl. 333—165 **32 Claims**



1. A charge transfer device ("CTD") recursive filter comprising a semiconductor substrate having a single channel formed thereon; means comprising at least two side-by-side

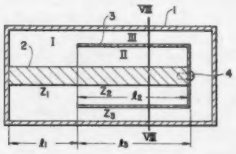
CTD delay lines for respectively transferring charges in opposite directions along said channel; a plurality of split electrodes in a first of said CTD delay lines, each of which constitutes a pair with a corresponding one of a plurality of split electrodes in the other of said CTD delay lines; even bridge electrode means occupying the entire width of said channel and separating each even pair of split electrodes from the next odd pair of split electrodes; odd bridge electrode means occupying the entire width of said channel and separating each odd pair of split electrodes from the next even pair of split electrodes; each even-odd pair of said split electrodes having first and second delay lines, respectively, which together provide a constant delay period if said even-odd pair is separated by an even bridge electrode; each odd-even pair of said split electrodes having first and second delay lines, respectively, which together provide a constant delay period if said odd-even pair is separated by an odd bridge electrode; each of said delay lines having an input connected to receive signals to be filtered and having an output connected to deliver filtered signals, means for separately generating odd and even clock pulses; means responsive to each odd clock pulse at said odd bridge electrodes for distributing charges at said odd bridge electrodes to the closer even bridge electrodes in accordance with the lengths the split electrodes associated with the odd bridge electrode; and means responsive to each even clock pulse at said even bridge electrodes for distributing charges at said even bridge electrodes to the closer odd bridge electrodes in accordance with the lengths of the split electrodes associated with the even bridge electrodes.

4,292,610

TEMPERATURE COMPENSATED COAXIAL RESONATOR HAVING INNER, OUTER AND INTERMEDIATE CONDUCTORS

Mitsuo Makimoto, and Sadahiko Yamashita, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 25, 1980, Ser. No. 115,396
Claims priority, application Japan, Jan. 26, 1979, 54-8352
Int. Cl.³ H01P *1/30, 7/04*
U.S. Cl. 333—222 **6 Claims**



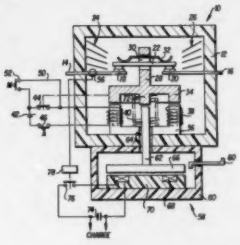
1. A temperature compensated, coaxial cavity resonator comprising, a first, outer conductor of a hollow structure, a second, inner conductor internally disposed in a coaxial relationship with said first conductor and in a short-circuit connection at one end thereof with one end wall of said first conductor and in an open-circuit relationship with the other end wall of the first conductor, and a third, inner conductor of a hollow structure coaxially disposed with and encircling said second conductor, said third conductor having a closed end which is connected to the open-circuit end of said second conductor and the axial extent of said third conductor being smaller than the axial extent of said second conductor, said first conductor having a thermal expansion coefficient equal to or greater than the thermal expansion coefficient of said second conductor and greater than the thermal expansion coefficient of said third conductor, longitudinal expansion of said first, second and third conductors as a function of temperature being electrically compensated by transverse expansion as a function of temperature of said first and third conductors, whereby said resonator has a resonant frequency that is substantially independent of temperature.

4,292,611

HIGH-SPEED AUTOMATIC TRIPPING CONTACTOR

Raymond Bresson, and Andre P. Ducluzaux, both of Grenoble, France, assignors to Merlin Gerin S.A., Grenoble, France

Filed Mar. 31, 1980, Ser. No. 135,271
Claims priority, application France, Apr. 9, 1979, 79 09123
Int. Cl.³ H01H *77/10*
U.S. Cl. 335—6 **9 Claims**



1. An electromagnetic contactor having a contactor unit comprising:

a coil wound on a stationary magnetic core which attracts a movable armature of magnetic material upon energization of said coil,

a movable contact carrier secured mechanically to said armature so as to be actuated between an open position and a closed position of contactor,

a stationary contact cooperating with a movable contact supported by said contact carrier, said contacts coming into engagement with each other in the closed position and being maintained in this position upon attraction of said movable armature against the magnetic core,

bias means urging a movable element comprising said armature and said contact carrier towards the open position upon deenergization of said coil,

a high-speed electrodynamic trip device associated to said contactor unit and including a control winding, a movable conductive disc arranged in front of said winding and a striker secured to said disc so as to strike said movable element upon energization of said control winding ensuring an electrodynamic repulsion of said disc which moves said movable element towards the open position against the electromagnetic attraction forces developed between said armature and core.

4,292,612

REMOTELY SWITCHABLE RESIDENTIAL CIRCUIT BREAKER

E. Keith Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 14, 1979, Ser. No. 94,021
Int. Cl.³ H01H *75/00, 77/00, 83/00*
U.S. Cl. 335—14 **6 Claims**

1. A remotely switchable circuit breaker comprising, in combination:

A. a molded, insulative breaker case;

B. a stationary breaker contact within said breaker case;

C. a movable breaker contact within said breaker case;

D. an over-center toggle-type breaker operating mechanism within said breaker case including

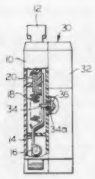
(1) a manual operating handle,

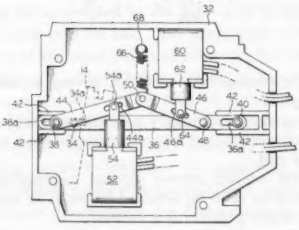
(2) a movable arm carrying said movable contact and pivotally connected with said handle,

(3) a cradle, and

(4) a mechanism spring acting between said cradle and

said arm, with said operating mechanism in its ON condition, said spring biasing said arm in one direction to a closed circuit position with said movable contact in electrical contacting engagement with said stationary contact, and, with said operating mechanism in its OFF condition, said spring biasing said arm in the opposite direction to bring said movable contact to an open circuit position in displaced relation to said stationary contact; and





E. a molded, insulative module case disposed in side-by-side relation with said breaker case; and

F. an operator module within said module case and including a remotely controllable actuating mechanism having an element reaching laterally into said breaker case and, with said breaker operating mechanism in its ON condition, engagingly moving said arm in said opposite direction away from its closed circuit position against the bias of said spring to create a current switching gap between said movable and stationary breaker contacts.

4,292,613

FLAT-SHAPED ELECTROMAGNETIC RELAY HAVING MULTIPLE CONTACTS

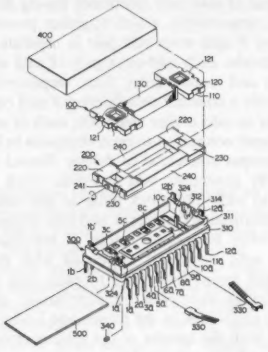
Yoshihide Bando, Kyoto, and Toshiki Tanaka, Yawata, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 17, 1979, Ser. No. 67,225
Claims priority, application Japan, Sep. 8, 1978, 53-110852
Int. Cl.³ H01H *45/02, 45/14*
U.S. Cl. 335—128 **15 Claims**

1. An electromagnetic relay having a plurality of external terminals comprising:

a flat electromagnetic device including a flat electromagnet, a plate member positioned opposite to said electromagnet, at least a portion of said plate member consisting in a magnetic member so that said magnetic member and electromagnet may be attracted toward each other upon energization of said electromagnet and at least one projecting member formed in said electromagnet or said plate member, said projecting member being disposed for a substantially vertical movement thereof in response to energization of said electromagnet;

a flat contact circuit device including a base made of electrically nonconductive material, a plurality of contact member pairs, each pair consisting of an elongated movable contact member and a stationary contact member, all of said contact members being supported by said circuit device and electrically connected to corresponding external terminals, each pair of said movable and stationary contact members providing a single close-and-open switching operation, said movable contact members being arranged in parallel with each other and substantially in coplanar relation, said electromagnetic device being mounted on said contact circuit device in parallel with each other and in mutually opposed relation,



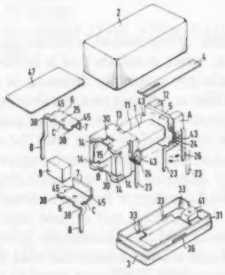
whereby said movable contact members are selectively biased by engagement at free ends thereof with said projection member in a lowered position thereof and return to their original positions by disengagement from said projection member in a raised position thereof to thereby accomplish a switching function such that predetermined pairs of said movable and stationary contact members are closed or opened on energization of said electromagnet.

4,292,614

ELECTROMAGNETIC RELAY

Kenji Ono, Yawata; Hidetoshi Matsushita, Ibaraki, and Minoru Shibata, Kadoma, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,356
Claims priority, application Japan, Aug. 29, 1978, 53-106045; Mar. 13, 1979, 54-29014
Int. Cl.³ H01H *45/04*
U.S. Cl. 335—202 **15 Claims**



1. An electromagnetic relay comprising

a bobbin having a coil wound thereon;

at least one fixed contact disposed relative to said bobbin and having a contact terminal;

at least one magnetically movable contact disposed for co-

operating with said at least one fixed contact in dependence upon energization of said coil;

coil terminals connected to respective ends of said coil;

a base having bores in its bottom wall through which said contact and coil terminals extend, and a peripheral wall projecting upwardly from said bottom wall; and

a cover fit onto said peripheral wall of said base to form a casing for said relay, wherein said cover has a downwardly projecting peripheral edge portion engaging the inner surface of said peripheral wall of said base, pockets for receiving a sealant being provided between said mutually engaging cover edge portion and base wall, and a projection extending upwardly from said base bottom wall to confine areas in which the sealant is to be injected.

4,292,615

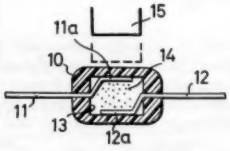
SWITCHING ELEMENT

Shigeo Ohashi, 5-20 Okusawa 1-chome, Setagaya-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 804,205, Jun. 7, 1977, abandoned. This application Jul. 24, 1979, Ser. No. 60,083

Int. Cl.³ H01H *9/00*

U.S. Cl. 335—205 **7 Claims**



1. In a switching element comprising a container made of insulating material, a plurality of terminals made of magnetic material and fixed on said container and extending from the inside of said container to the outside of said container, a mixture filled and hermetically sealed in said container, and magnetic means operatively connected to said container and operable to apply a magnetic field to said mixture, the improvement which resides in said mixture, said mixture being composed of a non-conductive liquid selected from the group consisting of lubricating oil and contact oil, and powder or particles made of conductive magnetic material suspended in said non-conductive liquid.

4,292,616

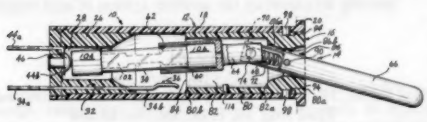
COMBINED TOGGLE SWITCH AND FRONT ACCESS FUSE HOLDER

James H. Andersen, 8005 E. Mercer Way, Mercer Island, Wash. 98040

Filed Apr. 4, 1980, Ser. No. 137,806

Int. Cl.³ H01H *85/00*

U.S. Cl. 337—4 **18 Claims**



1. A combination fuse holder and switch comprising:

body means including a first receptacle means for receiving one contact end of an elongated fuse, said body means defining a channel communicating between said first receptacle means and an opening on said body means, a first terminal associated with said body means and having a first contact in said first receptacle means, and a second terminal associated with said body means and having an arm located in said channel, said arm having a second contact therein spaced from said first contact,

switch means including a second receptacle means for retentively receiving a second contact end of said fuse, said switch means for moving said fuse transversely relative to the longitudinal axis thereof, means for placing said second contact end of said fuse in electrical contact with the exterior of said second receptacle means,

holder means for said switch means for coupling said switch means to said body means so that the first contact end of said fuse is in electrical contact with the first contact in said first receptacle means, the second contact on the arm of said second terminal being so positioned relative to said second receptacle means and said second receptacle means being so constructed as to make and break contact with the second end of said fuse when said second receptacle means is moved transversely relative to said fuse axis by said switch means.

4,292,617

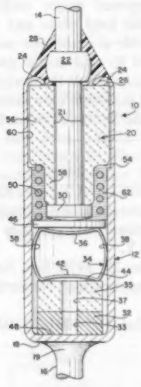
THERMAL SWITCH WITH ELECTRICALLY CONDUCTIVE THERMAL SENSING PELLET

John K. McVey, Bensenville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 27, 1980, Ser. No. 134,712

Int. Cl.³ H01H *37/76*

U.S. Cl. 337—407 **10 Claims**



1. A thermal switch comprising an elongated conductive housing having first and second ends, a first axial lead electrically connected to said conductive housing at said first end, an insulator positioned in said conductive housing at said second end, a second lead that passes through said insulator into the interior of said housing, a thermally sensitive pellet comprising a metallic composition and having a generally flat top surface inserted into said housing at said first end and positioned so as to leave a gap between said insulated lead and said first end, a thin conductive disc positioned in contact with said insulated lead, a compressed coiled spring that encircles at least a portion of said insulator so as to provide a spring bias force on said disc toward said sensing pellet and a ring-shaped electrically conductive contact member having a continuous periphery and a generally flat base surface which lies substantially parallel to said top surface of said thermal sensing pellet, side contact surfaces which contact the inside of said conductive housing when said contact member is inserted into said gap and a generally flat top surface which lies substantially parallel to said conductive disc, a load bearing wafer which has a substantially flat top and bottom surfaces positioned between the base surface of said contact member and the top surface of said thermal sensing pellet and a liquid metal-repellent grease con-

fined around said coiled spring by said conductive disc and said insulator.

4,292,618

SEMICONDUCTOR STRAIN GAUGE WITH ELASTIC LOAD PLATE

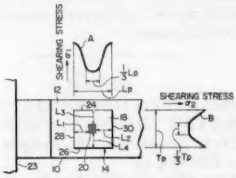
Masanori Tanabe; Satoshi Shimada, both of Hitachi; Akio Yasukawa, Chiyoda; Motohisa Nishihara, Katsuta, and Takeo Nagata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1980, Ser. No. 129,195

Claims priority, application Japan, Mar. 16, 1979, 54-31294

Int. Cl.³ G01L *1/22*

U.S. Cl. 338—5 **5 Claims**



1. A semiconductor strain gauge comprising an elastic load plate having a surface subject to stress; and a semiconductor substrate having opposed major surfaces one of which is bonded to said elastic load plate and the other of which is provided thereon with at least one strain gauge stripe, and electrodes connected to said strain gauge stripe, said strain gauge stripe being spaced from the peripheral edge of the latter major surface of said substrate by a distance which is at least $\frac{1}{3}$ times the length of the latter major surface.

4,292,619

RESISTANCE MATERIAL

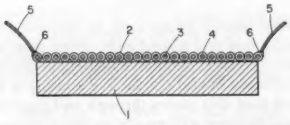
Cornelis A. H. A. Mutsaers, and Alexander H. Boonstra, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,643

Claims priority, application Netherlands, Jan. 12, 1978, 7800355

Int. Cl.³ H01C *1/012*

U.S. Cl. 338—308 **8 Claims**



1. A resistance material consisting essentially of oxidic particles, each of said particles coated with a resistance determining layer of a thickness of between 0.5–100 nm of at least one resistance determining material selected from the group consisting of resistance determining oxides and oxidic compounds.

4,292,620

FUEL LEVEL MONITORING ENGINE CONTROL AND VEHICLE THEFT INHIBITING DEVICE

Warren H. Pagane, 16 Forbes Hill Rd., Wollaston, Mass. 02170

Filed Jun. 13, 1979, Ser. No. 48,025

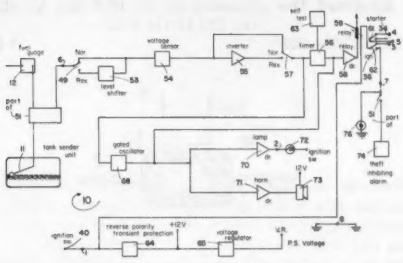
Int. Cl.³ B60R *25/04, 25/10*

U.S. Cl. 340—63 **6 Claims**

1. A fuel level monitoring, engine control and theft inhibition device for use with an engine having an electrical ignition system including an electrical ignition switch, a starter system, a fuel supply tank and an electrically operated fuel gauge system including a fuel sending unit and a fuel gauge interconnected electrically to the electrical ignition system, whereby a first signal voltage is generated to indicate the quantity of fuel in said fuel tank, said device serving to shut down the engine when the fuel supply in said tank reaches a predetermined low level but before said fuel supply is exhausted and to prevent said engine from being started by unauthorized persons, said device comprising:

voltage sensing means connected to the junction of the fuel sending unit and the fuel gauge of said electrically operated fuel gauge system, which voltage sensing means changes state when the first signal voltage reaches a predetermined value indicating a low level of fuel in said supply tank;

a gated oscillator connected to said voltage sensing means, said gated oscillator being enabled when voltage sensing means changes to a state indicating low fuel level, such that said oscillator operates at a predetermined frequency when enabled;



a warning means connected to and activated by said oscillator, such that said warning means provides an intermittent warning;

a relay including contacts connected electrically to the ignition system of said engine;

timing means including a counter connected to said oscillator to count cycles from said oscillator, such that after a predetermined number of cycles said counter de-energizes said relay and when said relay is de-energized said relay turns off said ignition system before said fuel supply is exhausted,

said counter being further connected electrically to said warning means by a feedback loop such that when said counter has reached a predetermined count, said warning means operates continuously;

switching means connected to said voltage sensing means, said warning means and said ignition system such that when said switching means is activated, the activation of said ignition system results in a simulation of a fuel condition below the predetermined low level such that said voltage sensing means changes state as indicated above thereby deactivating the ignition system of said engine.

4,292,621

CHARACTER READER

Paul Fuller, 29, Homeway, Harold Park, Romford, England

Filed Aug. 10, 1979, Ser. No. 65,658

Claims priority, application United Kingdom, Aug. 14, 1978, 33216/78

Int. Cl.³ G06K *9/28*

U.S. Cl. 340—146.3 H **9 Claims**

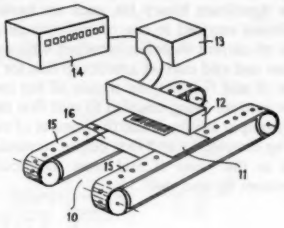
1. A method of reading characters arranged in a line on a document by means of a scanning action caused by relative movement between a reading device and said document, said method comprising the steps of:

(a) effecting said relative movement in a direction normal to the direction of said line of characters whereby all of the

characters in said line are read simultaneously by said reading device;

(b) generating simultaneously a plurality of parallel data signals in respect of each character read by said reading device so as to provide digitisation of each said character along a first axis transverse to the direction of the line of characters and thereby to form parts of matrices each of which is representative of a character;

(c) generating a pulsed signal the frequency of which is dependent on the speed of said document relative to said reading device;



(d) utilizing said pulsed signal to sample said plurality of parallel data signals so as to provide digitization of each character along a second axis orthogonal to said first axis and thereby complete said character matrices;

(e) storing said digitized matrix signals in a first memory means; and

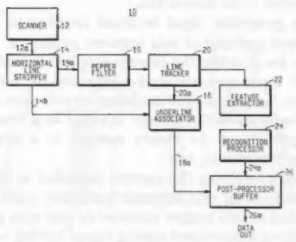
(f) comparing said stored matrix signals with stored patterns in second storage means thereby to recognize the characters read by said reading device.

4,292,622

SYSTEM AND METHOD FOR PROCESSING HORIZONTAL LINE CHARACTERISTICS IN AN IMAGE

Ernest G. Henrichon, Jr., Bedford, N.H., assignor to Hendrix Electronics, Inc., Manchester, N.H.

Filed Feb. 21, 1980, Ser. No. 123,485
Int. Cl.³ G06K 9/34
U.S. Cl. 340—146.3 SG **56 Claims**



1. Method for detecting horizontal line characteristics in an image, said image including one or more lines of symbols defined by elemental areas (pixels) having a first optical characteristic against a background defined by pixels having a second optical characteristic, said lines extending in a first direction, wherein each of said symbols is representative of a text character, or a horizontal line character, or a text character and an associated horizontal line character below said text character, comprising the steps of:

scanning at least one of said lines of symbols in said first direction, and

detecting the optical characteristics of the pixels in said scanned line and storing binary data representative of said detected characteristics,

processing said stored optical characteristic data corresponding to a succession of rectangular swaths of said scanned line, each swath being one pixel wide in said first direction and extending a predetermined number of pixels beyond said scanned line in said second direction, said processing including the step of identifying the stored data representative of each pixel for each current swath which one of the following conditions is met:

A. the corresponding pixel in said current swath has said first optical characteristic, and the corresponding pixels in at least a predetermined number $(X-1)$ of contiguous swaths have said first optical characteristic,

B. the corresponding pixel in said current swath has said first optical characteristic, and the corresponding pixels in at least a predetermined number $(Y-1)$ of contiguous swaths have said first optical characteristic, and said corresponding pixel is adjacent to a pixel in said current swath for which the corresponding stored data bit is representative of a horizontal line characteristic, where X and Y are integers and Y is less than X, and

C. the corresponding pixel in said current swath has said first characteristic and corresponding stored data bit for the next previous swath in said succession is representative of a horizontal line characteristic,

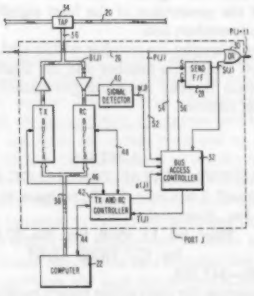
said identified data being representative of said horizontal line characteristics.

4,292,623

PORT LOGIC FOR A COMMUNICATION BUS SYSTEM

Kapali P. Eswaran, San Jose, Calif.; Vincent C. Hamacher, Toronto, Canada, and Gerald St. Shedler, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,493
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—147 R **12 Claims**



1. Method for attaining asynchronous, collision-free data signal communication on a local shared bus network interconnecting a plurality of transceiving ports, each port executing the steps of:

(1) signalling an intention to transmit a message;

(2) delaying transmission for a period equal to the total bus latency plus the propagation delay of an intention to transmit signal;

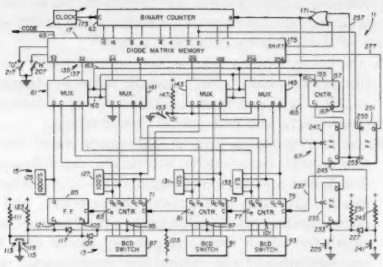
(3) ascertaining that no signals indicating an intention to transmit, and no data signals, are being received at said each port; and then

(4) sending the message.

4,292,624
INTERNATIONAL MORSE CODE NUMBER GENERATOR

William K. Serp, 4027 Harvey Ave., Western Springs, Ill. 60558

Filed Oct. 25, 1974, Ser. No. 517,813
Int. Cl.³ H04L 3/04
U.S. Cl. 340—347 DD 17 Claims



1. An apparatus for generating an encoded selected number having a plurality of significant digits comprising:

means for serially generating an encoded most significant digit of the number and subsequently serially generating encoded progressively lesser significant digits of the number;

said serial generating means including a selectively addressable memory having a plurality of exclusively addressable segments each containing an encoded digit, each of said segments having a plurality of individually addressable bit locations;

means for sequentially addressing those memory segments which correspond to the digits of the number;

means for sequentially addressing the bit locations of the addressed memory segment, and means responsive to the generation of an encoded digit for resetting said bit location address means and for advancing said segment address means to the address of a next lesser significant digit of the selected number whereby the selected number is translated into a serially generated code;

means for storing the selected number;

means for inhibiting the advance of said bit location address means and said segment address means upon the completion of the generation of the least significant digit of the selected number; and

means for changing the number within said storage means to the next sequential number and for disabling said inhibiting means thereby initiating generation of said next sequential number.

4,292,625
MONOLITHIC DIGITAL-TO-ANALOG CONVERTER

John A. Schoeff, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 12, 1979, Ser. No. 57,046
Int. Cl.³ H03K 13/05
U.S. Cl. 340—347 DA 14 Claims

1. An apparatus for converting binary number signals into an analog signal comprising:

a segment generator including

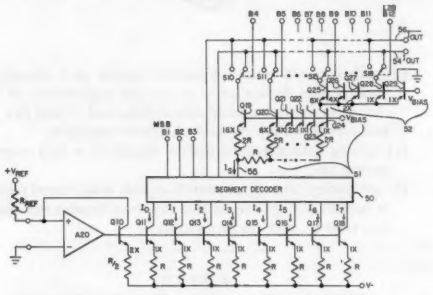
a first set of N input terminals disposed for receiving N binary bit signals representing the most significant bits of a binary number of M bits to be converted, wherein N and M are integers,

first, second and complementary output terminals,

2^N equal current sources,

N switching means, each coupled to one of said first set of input terminals and for generating a true logic output signal or a complementary logic output signal at a voltage level associated with the significance of said binary bit responsive to the signal upon said input terminal,

N sets of true and complementary current switches, each true current switch capable of coupling one of said current sources to said first output terminal in response to a true output signal, each complementary current switch capable of coupling one of said current sources to said complementary output terminal in response to a complementary output signal, each of said current switches further responsive to the voltage level of said true or complementary output signal so that a first current switch coupling one of said current sources in response to a true or complementary output signal of a more significant binary bit overrides a second current switch capable of coupling said one current source in response to a true or complementary output signal of a less significant binary bit, each set having 2^N current switches coupled to one of said switching means, said sets of current switches arranged with respect to each other and said current sources so that for any combination of said N binary bit signals all but one of said current sources being coupled to said first or complementary output terminals and the number of current sources being coupled to said first output terminal increases by one as the value of said most significant binary bits increases by one, and



means for coupling to said second output terminal said one current source not coupled to said first or complementary output terminals;

a step generator circuit including

a second set of input terminals disposed for receiving the remaining M–N of the binary bit signals of the binary number to be converted,

a step generator input terminal coupled to said second output terminal of said segment generator,

means for dividing the current supplied to said step generator input terminal into a plurality of individual currents, and means for coupling certain ones of said individually divided currents selected as a function of the magnitude of the binary number to a step generator output terminal; and

means for combining the current provided at said first output terminal of said segment generator with the current provided at said output terminal of said step generator so as to form a combined analog signal having an amplitude proportional to the value of the binary number to be converted.

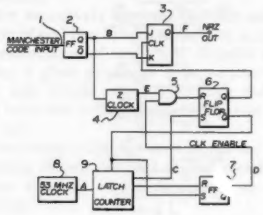
4,292,626
MANCHESTER DECODER

John R. Smithlin, North Hollywood, Calif., assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Aug. 23, 1979, Ser. No. 69,213
Int. Cl.² H03K 13/24
U.S. Cl. 340—347 DD 5 Claims

1. Means for decoding a Manchester coded signal to an NRZ coded signal comprising:

(a) means for receiving said Manchester signal,
(b) means for generating output pulses, each of said pulses starting when the generating means is enabled and ending when the generating means is disabled,
(c) means for providing a timing pulse signal having a bit period which is similar to that of the Manchester coded signal, but out of phase by about 90 degrees,
(d) means for providing a clock pulse with each baseline crossing of the Manchester coded signal,
(e) means for sensing of the direction of the crossing of the baseline upon the coincidence of the clock pulse and a predetermined polarity of the timing pulse signal,



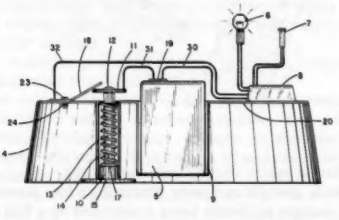
(f) means for timing an interval following each sensed baseline crossing of the Manchester coded signal, which interval is greater than one-half of a bit period,
(g) means for enabling of the generating means upon each said sensing which is outside said time interval and in the event the sensed direction of the baseline crossing is the same as the first baseline crossing, and for disabling the generating means upon each said sensing which is outside said time interval and in the event the sensed direction of the baseline crossing is opposite to that of said first baseline crossing to provide an NRZ coded signal at the output of the generating means.

4,292,627

TRAFFIC MARKER

Val F. Knight, 5900 W. Tropicana Ave., #45, Las Vegas, Nev. 89103

Filed Sep. 4, 1979, Ser. No. 72,127
Int. Cl.[3] E01F *9/00*; H01H *35/02*
U.S. Cl. 340—114 R **2 Claims**



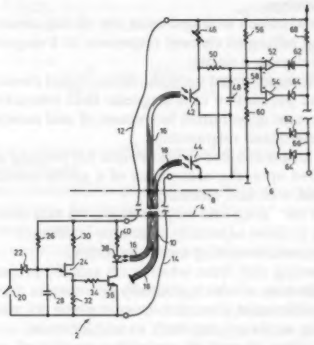
1. A road safety device comprises a ground-supported, weighted base, a hollow upright translucent marker member, electric light means for illuminating the marker member, battery means, switch means for automatically activating the light means when the marker is in an operating position and deactivating the light means when the marker is in a non-operating position, light-actuated switch means operatively electrically connected to the light means and the battery means such that said light-actuated switch means permits current to flow to the light means when ambient illumination is less than a predetermined level, and prohibits said current flow when the ambient illumination is greater than said predetermined level, the switch means comprising an actuating arm movable between an extended position protruding beyond the base and a depressed position, circuit closure means for electrically connecting the battery means to the light means when the actuating arm is in the depressed position and for disconnecting the battery means and light means when the actuating arm is in the extended position, biasing means for maintaining the actuating arm in a normally extended position, said actuating arm being positioned such that it is moved to the depressed position when the safety device is placed in operating position.

4,292,628

FIBRE OPTIC SECURITY SYSTEM

John A. Sadler, Rexdale, Canada, assignor to Chubb Industries Limited, Toronto, Canada

Filed Aug. 28, 1978, Ser. No. 937,577
Int. Cl.[3] G08B *1/00*; G02B *5/14*
U.S. Cl. 340—531 **4 Claims**



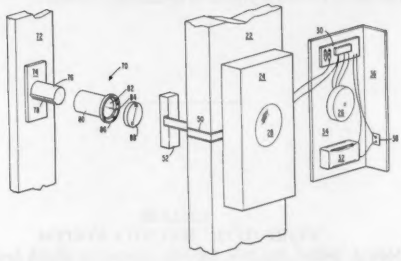
1. In a security alarm system comprising at least one sensor unit, a control unit, a connection between the sensor unit and the control unit, and an alarm circuit conditionable by said control unit to an alarm condition, the sensor unit being operative to apply a signal to the connection and to switch that signal from a normal state in response to sensing an abnormal condition, and the control unit being operative to monitor said signal for deviation from its normal state and to condition said alarm circuit in response to detection of such a deviation, the improvement in which the sensor unit includes an optoelectronic transmitter and the control unit includes first and second optoelectronic receivers, the said connection is established by a flexible optical light fibre guide coupled to said optoelectronic transmitter in the sensor unit and said first optoelectronic receiver in the control unit for transmission of said signal in the form of light from the sensor unit for reception by the control unit, and the control unit monitors at least one parameter of the signal in its normal state which is dependent upon the optical integrity of the guide for deviation outside predetermined limits, the optical fibres of said guide form two sub-bundles the fibres of which are intermingled intermediate the ends of the guide, one of the two sub-bundles being optically coupled to said transmitter and said first receiver and the other of the two sub-bundles being optically coupled to said second optoelectronic receiver but isolated from said transmitter.

4,292,629

ALARM SYSTEM

Ronald R. Kerr; Keith M. Mullins, both of Ft. Collins, Colo., and Bruce H. Bowie, Sparks, Nev., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 10, 1979, Ser. No. 101,875
Int. Cl.³ G08B *13/08*
U.S. Cl. 340—547 **3 Claims**



1. An intrusion alarm system comprising:
a first closure member;
a second closure member movable relative to said first closure member;
an electrical switch mounted upon one of siad closure members and having an element responsive to a magnetic field for developing a signal;
magnet means mounted upon the other of said closure members and productive of a magnetic field interactive with said element upon raltive movement of said members into a predetermined relationship;
signaling means coupled to said switch for yielding an alarm indication upon the occurrence of a given interaction of said field with said element;
means for mounting said magnet means on said other member in a position adjustably selectable in distance from said element, said mounting means including:
an outstanding stub from which a rib radially projects;
a sleeve the base of which gradually decreases in diameter in a circumferential direction from a given location until reaching an abrupt step back to said location;
and the radius of said rib permitting receipt of said stub within said sleeve in an appropriate relative rotational relationship but locking said sleeve to said stub upon rotation of said step relatively away from said rib.

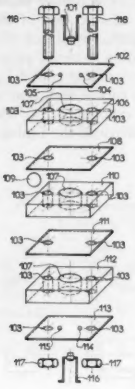
4,292,630

DEVICE FOR THE OBTAINING OF AN ELECTRIC SIGNAL WHICH IS PROPORTIONAL TO AN AMOUNT OF MOVEMENT AND THEREFORE CAPABLE OF DETECTING ANY MOVEMENT OR ACCELERATION

Claude Dumont, Heillecourt, France, assignor to Societe d'Etudes Techniques et Commerciales d'Automation, France

Filed Mar. 22, 1979, Ser. No. 22,994
Claims priority, application France, Sep. 19, 1978, 78 26759
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—573 **7 Claims**

1. Apparatus for detecting and signalling the presence of movement and absence of movement of an object moving randomly in space and time comprising, a portable transmitter carried in use by an object moving randomly in space and time and transmitting a carrier frequency signal, a detector associated with said transmitter for detecting the random movement of said object comprising a sensing means movable randomly in three dimensions in response to the random movement of said object and including a switch activated by said sensing means interrupting emission of the carrier frequency signal when said object is substantially immobile and re-establishing said emission of said carrier frequency signal upon renewed movement of said object after being substantially immobile an alarm, a portable receiver unit positioned in an area for receiving said carrier frequency signal, means on said receiver unit for activating said alarm after a predetermined period of continuous absence of emission of said carrier frequency signal is detected by said receiver unit, said sensing means comprising an element freely movable randomly in a three dimensional detection space in response to random movement of said object, and means defining said space.

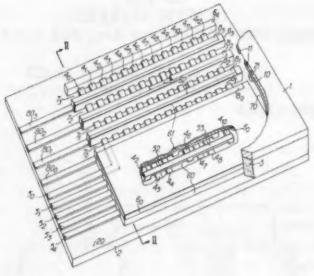


4,292,631

PLASMA MATRIX DISPLAY UNIT

Guy Gerard, 1, cité du Colombier, Perros Guirec, France (22700)

Filed Mar. 24, 1980, Ser. No. 133,321
Claims priority, application France, Apr. 3, 1979, 79 08393
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—771 **11 Claims**



1. A plasma matrix display unit comprising:
a prismatic gastight enclosure containing a low pressure gas, said gastight enclosure being constituted by a first rectangualr insulating plate which is transparent at least at the level of a plurality of uniformly spaced points aligned along a longitudinal line, by a second rectangular insulating plate and by a leak-tight sealing means defining the periphery of said enclosure and maintaining opposite the internal surfaces of said first and second plates,
first, second and third insulating strips which are substantially parallelepipedic on the internal surface of said second plate and which are perpendicualr to third metallic strips, said insulating strips forming two parallel longitudinal grooves therebetween, said second insulating strip extending longitudinally between said first and third insulating strips, each of said first and second insulating strips having a slot on the longitudinal edge facing to said third

insulating layer and said groove between said second and third insulating strips being aligned with the longitudinal line of transparent points of said first plate,

a first metallic strip and at least a second metallic strip extending parallely and longitudinally between said internal surfaces of said first and second plates, each of said first and second metallic strips having an external connection and being disposed at a predetermined distance from said internal surface of said second insulating plate in said slots,

a plurality of third parallel metallic strips on said internal surface of said second plate extending orthogonally to and at said predetermined distance from said first and second metallic strips, each of said third metallic strips passing plumb with one of said points and having an external connection,

means for successively applying between said external connection of said first or second metallic strip and said external connections of said third metallic strips a voltage causing a glow discharge which occurs between these strips and which emerges through the corresponding point when the voltage is applied to said second metallic strip, and

means receiving a display data signal for controlling the switching of said first and second metallic strips in said voltage applying means dependent on the data signal amplitude.

4,292,632

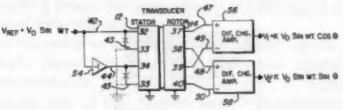
DISPLACEMENT SENSING DEVICE HAVING CAPACITANCE TRANSDUCTION ELEMENT

Lester M. Yeakley, 776 Morgan Dr., Boulder, Colo. 80303

Filed Aug. 29, 1978, Ser. No. 937,700

Int. Cl.³ G08C *19/10*

U.S. Cl. 340—870.37 **23 Claims**



1. A linear displacement sensing device, comprising:

a capacitance transduction element having relatively movable elongated portions capable of being adjacent to one another with each of said elongated portions having a substantially uniform surface area, and with one of said portions being connectable with a unit having one member displaceable with respect to another member to sense the displacement of said one member with respect to said another member;

input means for providing an input reference voltage to said capacitance transduction element; and

output means connected with said capacitance transduction element to receive charges therefrom and responsive thereto providing output voltages in snychro-resolver form to indicate the displacement of said one member with respect to said another member.

4,292,633

TWO-WIRE ISOLATED SIGNAL TRANSMITTER

Perry H. Goodwin, Jr., Dana Point, and Richard J. Kotalik, Santa Ana, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 24, 1978, Ser. No. 963,194

Int. Cl.³ G08C *19/02, 25/02*

U.S. Cl. 340—870.39 **8 Claims**

1. A two-wire signal transmitter for connection to a two-wire transmission line having a direct current voltage impressed thereon, and transmitter comprising:

(a) transducer input circuit means for directly connecting as one input to said transmitter a transducer signal;

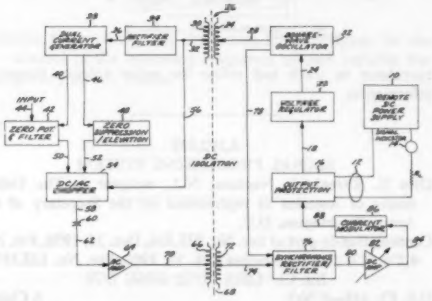
(b) reference voltage means for generating a reference voltage signal connected as a second input to said transmitter;

(c) comparator and converter means having as inputs said transducer signal and said reference voltage signal for providing an output as an alternating current signal indicative of the difference between said transducer signal and said reference voltage signal;

(d) alternating current amplifier means for amplifying said alternating current signal;

(e) signal transformer means having primary and secondary windings with said amplified alternating current signal connected to its primary winding for transferring said amplified alternating current signal to its secondary winding;

(f) alternating current to direct current synchronous detector means for converting the alternating signal in the secondary of said signal transformer means to a direct current signal;



(g) direct current amplifier means for amplifying said direct current signal;

(h) current modulator means for modulating a current in said transmission line in accordance with said amplified direct current signal;

(i) a power transformer having primary and secondary windings;

(j) direct current to alternating current power converter means for converting said direct current voltage on said transmission line to an alternating current power signal connected to said primary winding of said power transformer with said secondary winding of said power transformer connected to said comparator and coverter means as a converting drive signal thereto, and

(k) alternating current to direct current power converter means for converting an alternating current signal in said secondary winding of said power transformer to a direct current voltage to power said transducer input circuit means

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4,292,634

REAL-TIME MULTIPLE-LOOK SYNTHETIC APERTURE RADAR PROCESSOR FOR SPACECRAFT APPLICATIONS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Chialin Wu, Pasadena, and Vance C. Tyree, Arcadia, both of Calif.

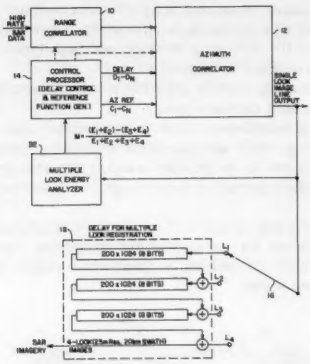
Filed Dec. 15, 1978, Ser. No. 969,761

Int. Cl.³ G01S *13/90*

U.S. Cl. 343—5 CM **6 Claims**

1. In a synthetic aperture data processor having pipeline multiple-look data capability with time-multiplexed single-look image lines from an azimuth correlator, the combination comprising means for analyzing the mean energy in an even number of multiple looks of the same target and means responsive

to the mean energy for closed-loop control processing of delay control and reference function coefficients for said azimuth



correlator to track and refine the radar antenna boresight information.

4,292,635

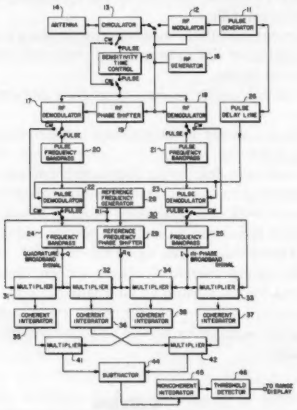
SIGNAL PROCESSING SYSTEM

Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 973,356, Dec. 26, 1978, Pat. No. 4,219,812. This application Feb. 19, 1980, Ser. No. 122,217

Int. Cl.³ G01S *13/52*; G06G *7/78*

U.S. Cl. 343—5 NQ **6 Claims**



1. A signal processing system responsive to at least one in-phase broadband signal and to at least one quadrature broadband signal in phase quadrature with said in-phase broadband signal, said processing system including at least one signal processor,

each of said signal processors including a reference frequency generator for providing a reference frequency output of a frequency lying within a predetermined portion of said signal band width,

a reference frequency phase shifter coupled to said reference frequency generator for providing a quadrature reference signal,

first quadrature means for multiplying said quadrature broad band signal and said reference frequency output,

second quadrature means for multiplying said quadrature broad band signal and said quadrature reference frequency output,

first in-phase means for multiplying said in-phase broad band signal and said quadrature reference frequency output,

second in-phase means for multiplying said in-phase broad band signal and said reference frequency output,

a coherent integrator coupled to each of said multipliers,

means for cross-multiplying the outputs of the integrators coupled to said first quadrature means for multiplying and to said first in-phase means for multiplying,

means for cross-multiplying the outputs of the integrators coupled to said second quadrature means for multiplying and to said second in-phase means for multiplying, and

a subtractor connected to the outputs of said first and second multiplying means.

4,292,636

PASSIVE REPLY DEVICE FOR USE IN THE AUTOMATIC WIRELESS TRANSMISSION OF MULTI-PLACE NUMERICAL INFORMATION BETWEEN ACTIVE INTERROGATION DEVICES AND SUCH PASSIVE REPLY DEVICES, WHICH ARE MOVABLE WITH RESPECT TO ONE ANOTHER AND METHOD OF MAKING THE SAME

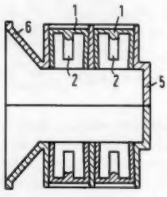
Walter Egger, Munich; Egon Edinger, Graefelfing, and Friedrich Pedall, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,668

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855721

Int. Cl.³ G01S *13/80*; H03J *5/14*

U.S. Cl. 343—6.5 SS **11 Claims**

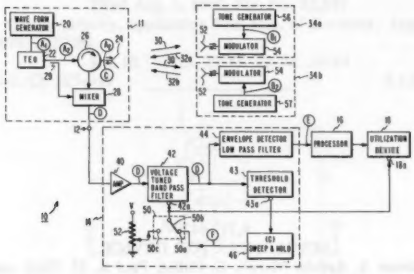


1. A passive reply device for automatic wireless transmission of multi-place numerical information between active interrogation and passive reply devices which are movable with respect to one another, particularly for track-bound transport means, comprising, a high frequency line section having a high frequency antenna at one end, and short circuited at its opposite end and formed with a plurality of bores, and a plurality of high frequency coaxial resonators received in said bores and extending transversely to and carried by said line section, each resonator formed of a soft metallic material and comprising a tubular member having an open end communicating with the interior of said line section and closed at its opposite end, each resonator being provided with a rod-like coaxial inner conductor stub, said resonators having a like construction with the exception of the respective end walls at their closed ends, the respective resonant frequencies of the respective resonators being derived from differences in configuration of the inner faces of said resonator end walls, which due to the application of axial force to said end walls may vary from convex shape to concave shape, depending upon the direction and amount of said axial force each of said resonators being disposed in a respective cooperable bore in said line section, with their open ends communicating with the interior of said line section and retained therein by a press fit.

4,292,637
INTERROGATING RADAR FOR USE WITH TAGGED TARGETS

Henry C. Johnson, Hillsborough Township, Somerset County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,110
Int. Cl.[3] G01S *13/78*
U.S. Cl. 343—6.5 SS 7 Claims



1. An interrogating station for use in a system which includes a plurality of targets remote from said interrogating station for identifying one of said targets and at least one of its range and range rate, said targets having means for receiving modulated interrogtion signals from said station and, in response thereto further modulating said signals, and radiating to said interrogating station said further modulated signals, said further modulated signals having a characteristic indicia which differs from target to target, said interrogating station comprising in combination:

means for generating said modulated interrogation signals including means for generating a sample signal indicative of said interrogation signals;

means receptive of said further modulated signals and said sample signal for generating difference signals having distinguishable components indicative of signals from various ones of said targets, said distinguishable components varying from target to target;

means providing a control signal having a selectable value;

means responsive to said difference signals and to said control signal for passing only that difference signal associated with a given target determined by the value of said control signal; and

means responsive to said passed difference signals for generating a signal indicative of at least one of range and range rate relative to said interrogating station of the target associated with said passed difference signal.

4,292,638
AUGMENTED RADIOMETRIC SYSTEM

Robert E. Lazarchik, Largo, and Robert S. Roeder, Dunedin, both of Fla., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 17, 1971, Ser. No. 154,099
Int. Cl.[3] G01S *13/86*
U.S. Cl. 343—7.5 12 Claims

1. In a radiometric system:

voltage controlled variable frequency circuit means for supplying first and second cyclic signals in substantially phase quadrature relation,

first noise source means for space transmission of cyclic noise signals in response to said first cyclic signal,

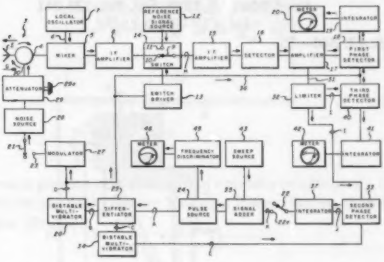
receiver means for receiving versions of said cyclic noise signals,

said receiver means having signal envelope detection means,

first and second phase detector means,

said first phase detector means being responsive to said first cyclic signal and to said signal envelope detector means for producing a signal of amplitude related to the amplitude of said received cyclic noise signals,

said second phase detector means being responsive to said second cyclic signal and to said envelope means for producing a frequency control signal, and

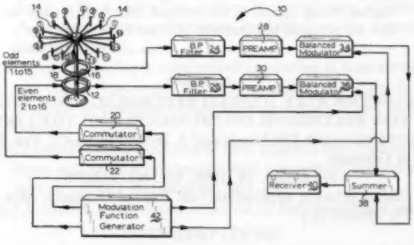


means for applying said frequency control signal for the control of the operating frequency of said variable frequency circuit means.

4,292,639
QUASI-DOPPLER DIRECTION FINDING EQUIPMENT

Joseph E. Bambara, North Babylon, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Dec. 17, 1979, Ser. No. 103,930
Int. Cl.[3] G01S *3/54*
U.S. Cl. 343—113 DE 8 Claims



1. A quasi-doppler direction finder comprising: an antenna having a plurality of elements arranged in circular array, said elements being divided into a plurality of inter-leaved groups;

means for commutating through each of the elements to sequentially turn said elements on and then off step wise through each group and sequentially between groups with overlap of the on time between adjacent elements;

a modulation function generator for generating signals to attenuate the signals received by the elements of each group with modulating signals, the modulating signal for each group of elements being out of phase with respect to the modulating signal for each other group of elements;

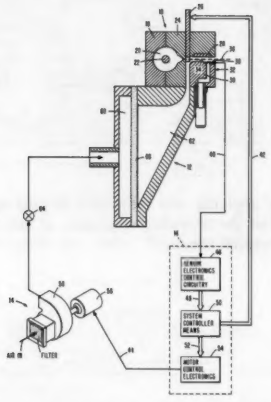
a receiver; and

means for combining the attenuated element signals and feeding the same to said receiver.

4,292,640
CLOSED LOOP COMPENSATION OF INK JET AERODYNAMICS

Gerald B. Lammers, Boulder, and Gregory L. Ream, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1980, Ser. No. 135,041
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **22 Claims**



1. In an ink jet printing system wherein one or more continuous streams of ink are broken up into streams of individual droplets of ink and a trajectory characterizing means for channeling the droplets into a print flight path and a no-print flight path, the improvement comprising:

a first means for ejecting a laminar airflow into the flight path of the droplets;

a means approximately positioned in relation to the ink droplets, said means being operable to sense a velocity associated with the droplets and for developing a first control signal representative of said velocity; and

a controller operable to receive the first control signal and to generate a second control signal, said second control signal being operable to energize the first means so that the velocity of the laminar airflow is adjusted.

4,292,641
ELECTRICALLY HEATED RECORDING INDICATOR FOR RECORDING INSTRUMENTS AND THE LIKE

Josef Grassmann, Cäcilienstrasse 4, D-5202 Hennef 1, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,075
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 7908387[U]
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 R **9 Claims**

1. An electrically heated recording indicator for use in a recording instrument utilizing a thermosensitive recording medium, comprising:

(a) an outer tubular support member having an aperture therein located in the vicinity of one end thereof constituting the writing area;

(b) an inner non-metallic tubular member positioned in said outer tubular support member, said inner tubular member extending across said aperture in said outer tubular support member; and

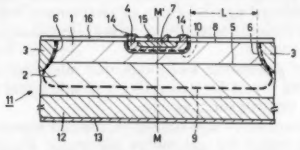
(c) electrical means for heating said inner tubular member;

(d) whereby said heated inner tubular member may directly contact said thermosensitive recording medium through said aperture in said tubular support member to write on said recording medium.

4,292,642
SEMICONDUCTOR DEVICE

Johannes A. Appels; Marnix G. Collet; Paul A. H. Hart, and Johannes F. C. M. Verhoeven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 16, 1979, Ser. No. 4,004
Claims priority, application Netherlands, Jan. 18, 1978, 7800582; Jul. 24, 1978, 7807835
Int. Cl.³ H01L *29/90*
U.S. Cl. 357—13 **34 Claims**



1. A semiconductor device having a semiconductor body having at least one bipolar high voltage semiconductor circuit element, said bipolar circuit element comprising:

substantially flat first and second opposed surfaces on said semiconductor body;

an island-shaped first region of a first conductivity type adjoining said first substantially flat surface;

a second region of a second conductivity type underlying said first region;

said first region forming with said underlying second region of the second conductivity type a first pn-junction extending substantially parallel to said first surface;

a third region of said second conductivity type extending betwen said second region and said first surface;

said first region being laterally bounded at least partly by a second pn-junction with an associated depletion zone which is formed between said first region and said third region;

said second pn-junction having a lower breakdown voltage than said first pn-junction;

a contact region adjoining said first surface and said first region;

said contact region being bounded entirely by said first region;

the doping concentration and the thickness of said first region being so small that upon applying a voltage in the reverse direction between said first and said second regions, the depletion zone, at least between said contact region and said third region extends from said first pn-junction up to said first surface at a voltage between said first and second regions which is lower than the breakdown voltage of said second pn-junction.

4,292,643
HIGH CUT-OFF FREQUENCY PLANAR SCHOTTKY DIODE HAVING A PLURALITY OF FINGER-LIKE PROJECTIONS ARRANGED IN PARALLEL IN A TRANSMISSION LINE

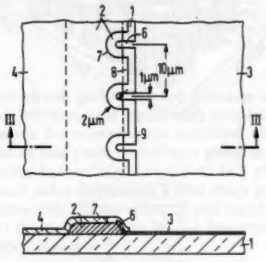
Walter Kellner, Putzbrunn; Hermann Kniepkamp, Munich, and Dietrich Ristow, Neubiberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 1, 1979, Ser. No. 62,677

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1978, 2837283

Int. Cl.³ H01L *29/48, 29/56, 29/64*

U.S. Cl. 357—15 **5 Claims**



1. A planar Schottky diode for high cut-off frequency, comprising: a substrate; a conductive transmission line having first and second parts arranged on the substrate; a doped semiconductor area positioned between a portion of the transmission line and portions of the substrate; a Schottky contact comprising finger-like extensions of the first part of the transmission line extending into a recess of the second part of the transmission line such that said second part partially surrounds on ohmic metal contact created between the finger-like portion and the doped semiconductor area on which the finger-like portion lies and where a contact edge of the Schottky contact is formed; said recess of the second part of the transmission line being defined by an ohmic resistance contact edge along the contact between said doped semiconductor area and the transmission line second part; a ratio of a length of said ohmic resistance contact edge to a length of said contact edge of the Schottky contact being significantly greater than 1; and a plurality of said Schottky contacts arranged parallel to one another at right angles to a running direction of the first and second parts of the transmission line and extending substantially over a width of the transmission line whereby a disruption of a characteristic impedance of the transmission line is avoided.

4,292,644
CONTROL OF VALLEY CURRENT IN A UNIJUNCTION TRANSISTOR BY ELECTRON IRRADIATION

Hing C. Chu, and Y. S. Edmund Sun, both of Liverpool, N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 828,028, Aug. 26, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 25,870

Int. Cl.³ H01L *29/74*

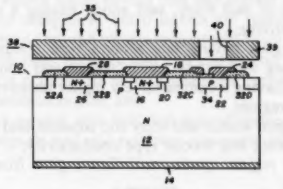
U.S. Cl. 357—21 **3 Claims**

1. An improved unijunction transistor comprising:

a body of semiconductor material of a first conductivity type characterized by a first lifetime;

first and second spaced apart base electrodes on said body;

a region in said body of semiconductor material of a conductivity type opposite said first conductivity type for controlling current flow between said first and second base electrodes, said region forming a p-n junction with said body;



at least a portion of said region of opposite conductivity type proximate said junction having a lower lifetime than said first lifetime.

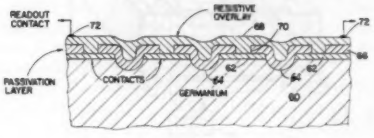
4,292,645
CHARGE SPLITTING RESISTIVE LAYER FOR A SEMICONDUCTOR GAMMA CAMERA

Philip A. Schlosser, Columbus, and Don W. Miller, Westerville, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed Oct. 19, 1979, Ser. No. 86,464

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—29 **8 Claims**



1. A semiconductor gamma camera detector comprising:

(a) a portion of semiconductor material with two surfaces, a first surface including an n doped region and a second surface including a p doped region; said doping configured with the semiconductor material to form a p-i-n diode with a depletion region for producing electrical charge in response to radiation impinging on the semiconductor material;

(b) a passivation layer substantially covering at least some of said doped regions and defining openings extending therethrough in communication with portions of said doped regions;

(c) a resistive layer covering at least a part of said passivation layer and extending through said passivation layer openings to contact said regions; and

(d) electrical connections attached to said resistive layer.

4,292,646
SEMICONDUCTOR THYRISTOR DEVICE HAVING INTEGRAL BALLAST MEANS

Jacques M. Assour, South Brunswick, N.J.; Theresa I. Bates, Long Pond, Pa.; John R. Bender, Middlesex, and John M. S. Neilson, Bridgewater, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,554

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **8 Claims**

1. An overvoltage protected semiconductor thyristor device in which breakdown due to overvoltage originates where a PN junction intersects the exterior surface of the semiconductor, said device comprising:

a body of semiconductor material having first and second major opposing surfaces;

a base region within said body and having a one type conductivity;

an anode region within said body and adjacent said second surface of said body, said anode having a second type conductivity;

a first region having said second type conductivity and bounding said anode region within said body, said first region having a comparatively higher resistivity than said anode region;

a gate region within said body and adjacent said first surface and having said second type conductivity;

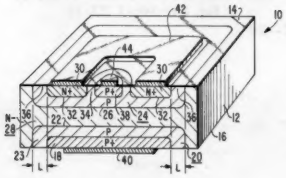
said base region spacing said first region from said gate region;

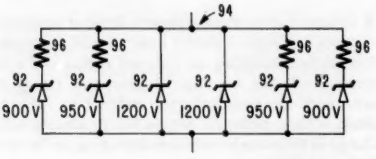
said base region and said first region forming a first PN junction where they meet, said first PN junction extending to the exterior surface of said body;

said base region and said gate region forming a second PN junction where they meet, said second PN junction extending to the exterior surface of said body;

a cathode region within said body and adjacent said first surface having said one type conductivity, said cathode region being spaced from said base region by said gate region, said cathode region having a comparatively higher carrier concentration than said gate region;

first electrode means overlying and electrically contacting said cathode region;





second electrode means overlying and electrically contacting said anode region;

said first region having therein a first resistive ballast means for, in the event of an overvoltage breakdown of said first PN junction in the vicinity of where it intersects said exterior surface, limiting the breakdown current which will flow through a localized breakdown region of said first PN junction in the vicinity of where said first PN junction intersects the exterior surface of said body, said first resistive ballast means being that portion of said first region through which breakdown current will flow in passing from said second electrode means to the portion of said first PN junction which is in the vicinity of said exterior surface;

said gate region having therein a second resistive ballast means for, in the event of an overvoltage breakdown of said second PN junction in the vicinity of said exterior surface, limiting the breakdown current which will flow to a localized breakdown region of said second PN junction in the vicinity of where it intersects said exterior surface of said body, said second resistive ballast means being that portion of said gate region through which breakdown current will flow in passing between said first electrode means and the portion of said second PN junction which is in the vicinity of said exterior surface.

4,292,647

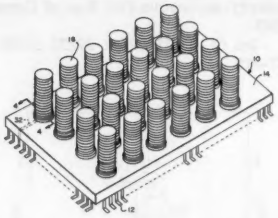
SEMICONDUCTOR PACKAGE AND ELECTRONIC ARRAY HAVING IMPROVED HEAT DISSIPATION

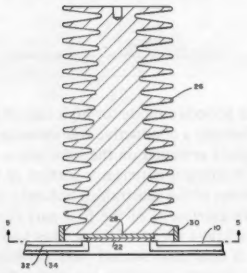
James C. K. Lee, Los Altos Hills, Calif., assignor to Amdahl Corporation, Santa Clara, Calif.

Filed Apr. 6, 1979, Ser. No. 27,769

Int. Cl.³ H01L *39/02, 23/02, 23/12*

U.S. Cl. 357—81 **20 Claims**





1. An electronic array comprising a substrate having a conductive lead pattern and a plurality of sets of contacts on a major surface, each set of contacts being configured to receive contacts of a semiconductor chip, a closed length of bond receptive material surrounding each set of contacts, a plurality of semiconductor chips, each of said chips having a plurality of contacts on one surface with said plurality of contacts attached to one of said sets of contacts on said major surface, a plurality of heat dissipation members each with a contact surface having an area greater than the area of a corresponding one of said chips and each having an outer wall formed at the termination of said contact surface, means attaching each chip to a central region of the contact surface of a heat dissipation member, and means bonded to the outer wall of each of said heat dissipation members and to one of said closed length of bond receptive material for enclosing each of said chips.

4,292,648

COLOR CORRECTOR FOR A COMPOSITE COLOR VIDEO SIGNAL

Leonard Kowal, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 9, 1979, Ser. No. 28,303

Int. Cl.³ H04N *5/76, 5/78*

U.S. Cl. 358—8 **7 Claims**

1. A system for color correcting a composite color video signal having horizontal sync defining consecutive horizontal lines and having an unstable chrominance component containing time base errors, the system comprising:

means for separating the chrominance component including color burst from said composite video signal;

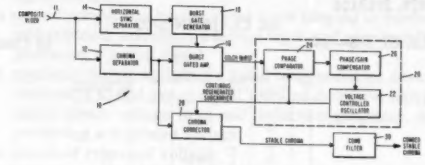
means for separating the horizontal sync from said composite video signal;

means responsive to the horizontal sync for gating the color burst to a color subcarrier generating means;

means for generating a continuous color subcarrier signal that is substantially phase locked to the phase of the color burst;

means for stabilizing the unstable chroma component utilizing said continuous color subcarrier signal;

comb filter means including an input and a summing junction



with two circuit paths coupled between said input and summing junction, said input being coupled to said stabilizing means for receiving the stabilized chroma component, one of said paths including a phase inversion means and a delay line serially coupled to said phase inversion means, said delay line having a time delay greater than the circuit time delay of the other of said paths by an amount equal to the time duration of one horizontal line of the color video signal.

4,292,649

COMPOSITE VIDEO SIGNAL COMBINING SYSTEM

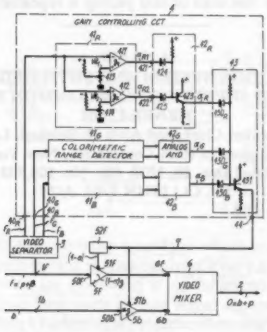
Guy R. Macheboeuf, Vitry-sur-Seine, France, assignor to Telediffusion de France, Paris, France

Filed Feb. 14, 1980, Ser. No. 121,779

Claims priority, application France, Feb. 12, 1979, 79 03521

Int. Cl.³ H04N 9/535

U.S. Cl. 358—22 **13 Claims**



1. A system for combining first and second composite video signals into a resulting composite video signal, said first composite video signal representing a first color picture having a first trichromatic region envelopping a second trichromatic region through a trichromatic transition region and said second composite video signal representing a second color picture, said system comprising:

first input means for receiving said first composite video signal;

second input means for receiving said second composite video signal;

third input means for receiving first component video signals forming said first composite video signal;

means connected to said third input means for producing a first analog signal $(1-\alpha)$ and a second analog signal (α) which control the crossing of said first and second composite video signals through said first and second input means to provide first and second output composite video signals which are obtained from an amplification with a gain proportional to said first and second analog signals, said first analog signal having first and second levels when said first component video signals are representative of said first and second picture regions and having intermediate levels lying between said first and second levels when said first component video signals are representative of said transition region; and

means for mixing said first and second output composite video signals into said resulting composite video signal.

4,292,650

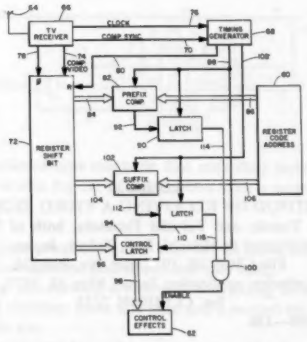
STV SUBSCRIBER ADDRESS SYSTEM

Melvin C. Hendrickson, Elmhurst, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 29, 1979, Ser. No. 88,902

Int. Cl.³ H04N 7/16

U.S. Cl. 358—123 **20 Claims**



1. In a system wherein each of a plurality of television receivers is identified by a unique address code, a method for addressing selected ones of said plurality of television receivers comprising the steps of:

transmitting during a first predetermined horizontal scanning line of the vertical interval of a broadcast television signal an address code portion which is common to the address codes identifying at least a group of said selected television receivers;

transmitting during a second predetermined horizontal scanning line of the vertical interval of a broadcast television signal the remaining portions of the address codes identifying at least two of said selected television receivers of said group; and

decoding said transmissions for addressing said at least two television receivers.

4,292,651

EXPANSION AND COMPRESSION OF TELEVISION SIGNALS BY USE OF DIFFERENTIAL CODING

Francis Kretz, 5 rue de la Coer'x-Connue, 35510 Cesson-Sevigne, and Jean-Louis Boudeville, 6 rue de la Cotiniere, 35500 Vitre, both of France

Filed Feb. 9, 1979, Ser. No. 10,694

Claims priority, application France, Dec. 8, 1978, 78 35485

Int. Cl.³ H04N 7/12

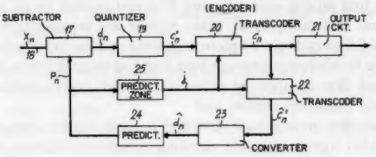
U.S. Cl. 358—135 **11 Claims**

1. A method of compressing and expanding numerical television signals with DPCM differential coding, said method comprising the steps of:

a. predicting an estimate of what a television signal should be;

b. at least partially quantizing said signals with a quantizing

characteristic which is non-symmetrical relative to zero; and



c. modifying said quantized signals with respect to the value of a predetermined reconstruction threshold and to the levels of the differences between the actual value of a television signal sample and the value predicted in step a.

4,292,652

METHOD OF RECEIVING A VIDEO SIGNAL

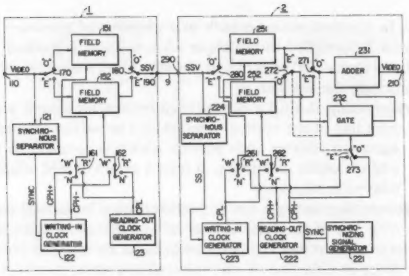
Yasufumi Yumde, and Takashi Furuhata, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 12, 1978, Ser. No. 905,524

Claims priority, application Japan, May 13, 1977, 52-54303

Int. Cl.³ H04N *7/12*

U.S. Cl. 358—138 **17 Claims**



1. In a method of receiving a video signal made up of picture elements the number of which is reduced by one-half transmitted with a narrow band frequency wherein the received video signals are first written as a narrow band frequency video signal into memories and are then read out therefrom at a higher reading-out speed than the writing-in speed so as to broaden the band allocation to the read-out signals, the improvement in which the timing of reading out odd lines corresponding to an odd field constituting one field of a display image of the video signal is shifted from the timing of reading out even lines corresponding to an even field constituting the other field of the same display image by a time substantially equal to half the reciprocal of the transmission wide band frequency which corresponds to the resolution limit for the reproduction of the image, said even lines being interlaced with said odd lines, and vacant picture elements included among said odd lines in said even lines being interpolated by means of adjacent real picture elements included among said odd lines and said even lines.

4,292,653

METHOD AND CIRCUIT FOR READING-OUT DATA FROM A TELEVISION PICKUP (IMAGE SENSOR)

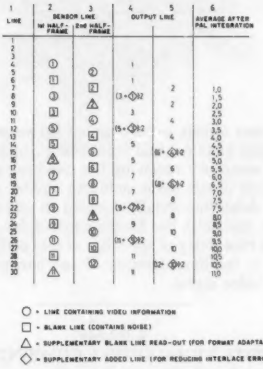
Gerd Bock, Seeheim; Herbert Zettl, Erfelden; Hans-Wilhelm Zappen, Bensheim, and Friedrich Zimmermann, Rossdorf, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 128,441

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1979, 2913116

Int. Cl.³ H04N *5/02*

U.S. Cl. 358—140 **11 Claims**


LINE
SENSOR LINE
1st HALF-FRAME
2nd HALF-FRAME
OUTPUT LINE
AVERAGE AFTER PAL INTEGRATION
○ = LINE CONTAINING VIDEO INFORMATION
□ = BLANK LINE (CONTAINS NOISE)
△ = SUPPLEMENTARY BLANK LINE READ-OUT (FOR FORMAT ADAPTATION)
◇ = SUPPLEMENTARY ADDED LINE (FOR REDUCING INTERLACE ERROR)

1. A method for reading out data from a TV pickup (image sensor) designed for a 525line standard, in compatibility with a 625-line standard user system, wherein, according to the invention,

every third line scan of said pickup is repeated twice.

4,292,654

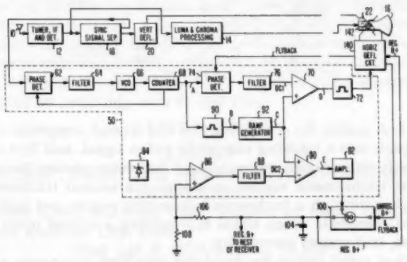
DEFLECTION SYSTEM AND SWITCHED-MODE POWER SUPPLY USING A COMMON RAMP GENERATOR

Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,503

Int. Cl.³ H04N *5/04, 3/18*

U.S. Cl. 358—158 **10 Claims**



1. In a television receiver, including a deflection generator adapted to be synchronized with pulses produced by a source of synchronizing pulses, apparatus comprising:

a ramp generator having an input coupled to said source of synchronizing pulses and an output for producing a sawtooth waveform;

a phase detector having a first input coupled to said source of synchronizing pulses and a second input coupled to said

deflection generator for receiving horizontal rate pulses therefrom for producing a first control signal in response to the frequency and phase difference between said synchronizing pulses and said horizontal rate pulses;

a first comparator having a first input coupled to receive said first control signal and a second input coupled to receive said sawtooth waveform, and an output;

means for coupling the output of said first comparator to said deflection generator for applying a horizontal drive signal thereto;

a second comparator having a first input coupled to receive said sawtooth waveform, a second input, and an output for producing a gating signal;

a regulator circuit, including a gated semiconductor device responsive to said gating signal, coupled to receive unregulated direct voltage from said deflection generator, for producing a regulated voltage;

a source of reference voltage;

a third comparator having a first input coupled to said reference voltage source and a second input responsive to said regulated voltage for producing a second control signal; and

means for coupling said second control signal to said second input of said second comparator.

4,292,655
SYSTEM INCORPORATING WORD SYNCHRONIZATION FOR A SERIAL SIGNAL SEQUENCE

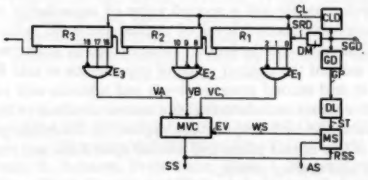
Marino G. Carasso, and Johannes J. Verboom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,735

Claims priority, application Netherlands, Nov. 6, 1978, 7811004

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—40 **13 Claims**



1. A system incorporating a medium which presents signal sequences which consist at least partly of binary signal sequences, and a device for generating a synchronization signal for synchronizing at least parts of said signal sequences (words, blocks), wherein a binary signal sequence contains a synchronization pattern which consists of (2N+1) groups of codes, each with a number of n (n>2) bits, a number of (at the most N+1) groups having a code content which has at least a given minimum Hamming distance with respect to the code (codes) of the other group (groups), said device constituting a majority decision device which produces the synchronization signal by means of said codes on the basis of a majority decision (N+1 out of 2N+1), characterized in that:

a number of m (m>0) bits is added to the codes of n bits in the (2N+1) groups, the groups having a code length m+n such that there is only an acceptably small risk that a disturbance (burst) occurring or present in the medium extends over a length which exceeds the length of m+n bits;

the number (at the most N+1) of groups consisting of m+n bits having a code content which has a given at least minimum Hamming distance with respect to the code (codes) of the other group (groups); and

only the n bits of each group still being used for producing the synchronization signal.

4,292,656
ENCLOSED-TYPE MAGNETIC DISC RECORDING AND/OR REPRODUCING APPARATUS

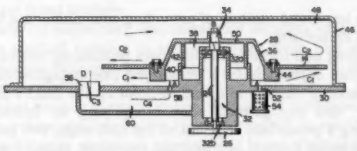
Masahiko Fujioka, Hamura, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 835,060, Sep. 21, 1977, Pat. No. 4,185,308. This application May 29, 1979, Ser. No. 42,786

Claims priority, application Japan, Sep. 24, 1976, 51-114436

Int. Cl.³ G11B *17/00*

U.S. Cl. 360—97 **1 Claim**



1. An enclosed-type magnetic disc recording and/or reproducing apparatus for use in conjunction with a magnetic disc, comprising:

a base;

a disc cover attached to said base and defining an enclosed chamber between said cover and said base;

a bearing unit having a first end protruding into said enclosed chamber from said base and a second end exposed to open air;

a shaft supported by said bearing unit and having a tip end protruding into said enclosed chamber;

a flange attached to the tip end of said shaft and adapted to have said magnetic disc attached thereto;

a first cylindrical projecting member projecting toward said flange from said base concentrically with said shaft;

a second cylindrical projecting member projecting toward said base from said flange and overlapping said first cylindrical projection member to form a narrow gap between the overlapping portions of said cylindrical projecting members, whereby a separate press...e chamber surrounded by said flange, said base and both cylindrical projecting members is formed;

blades attached to said flange and protruding toward said base from said flange;

means for rotating said shaft, said flange, said disc, said second cylindrical projecting member and said blades during operation of said recording and/or reproducing apparatus to produce thereby a first region of relatively lower pressure in the vicinity of said blades and a second region of relatively higher pressure between said flange and said cover, said first region being communicated with open air through a first air inlet bored in said base, and said second region being communicated with said separate pressure chamber through a second air inlet bored in said flange;

wherein said gap between the overlapping portions of said first and second cylindrical projecting members is sufficiently narrow and sufficiently long to restrict air leakage from said separate pressure chamber through said gap to maintain said separate pressure chamber at higher than atmospheric pressure; and

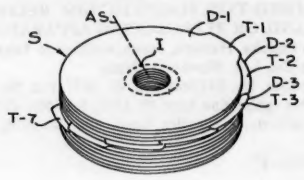
a filter attached to said base for cleaning air flowing into said enclosed chamber through said first air inlet.

4,292,657

PARTITIONABLE FLEXIBLE DISK PACK

Wilfred D. Iwan, Sierra Madre, and Ko K. Gyi, Thousand Oaks, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 21, 1979, Ser. No. 40,956
Int. Cl.[3] G11B 5/82, 25/04
U.S. Cl. 360—98 12 Claims



1. An improved method of providing manipulating a floppy disk file comprising:

arranging and forming flexible data processing record disks so that each includes a prescribed like engagement edge extending radially at a certain point on the disks's periphery, this engagement edge comprising an indentation along a prescribed segment of the disk edge, this indentation being formed as a gradual recession, radially inward along said segment, this recession terminating, relatively abruptly, in said edge;

stacking the disks into a pack so that each said engagement edge is disposed at a different angular position about the stack circumference; and

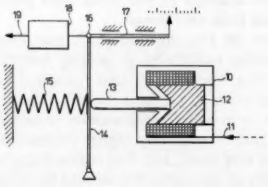
providing automatic disk-file partition means adapted to split the disk pack and expose a selected disk surface by timed engagement with a prescribed one of the engagement edges; while rotating said stack and providing data processing transducer means adapted to operate upon said selected disk surface by timed entry into the pack so-split.

4,292,658

MONITOR APPARATUS FOR ELECTRICAL CIRCUITS WITH VIRTUAL RESISTANCE

Johannes Locher, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 9, 1979, Ser. No. 11,022
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1978, 2805876
Int. Cl.[3] H02H 03/08; F02B 03/08
U.S. Cl. 361—93 6 Claims



1. A monitoring apparatus for electrical devices, especially for sensors and control elements associated with the fuel management system of an internal combustion engine, wherein one control element to control operation of the fuel management system includes an electromagnetic and movable armature, said control element exhibiting inductance, whereby the current passing through said control element is diminished during motions of said armature, said monitoring apparatus comprising:

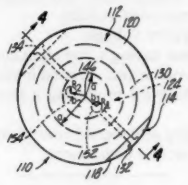
at least one threshold switch for comparing electrical signals from said sensors and control elements having a threshold value and for actuating said control elements when the value of said signals exceeds the threshold value, and wherein the improvement comprises that the actuation current of said control element lies between zero and the threshold value.

4,292,659

PRESSURE SENSING CAPACITIVE TRANSDUCER

Binneg Y. Lao, West Bloomfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 947,908, Oct. 2, 1978, Pat. No. 4,238,662.
This application Dec. 26, 1979, Ser. No. 107,290
Int. Cl.[3] H01G 7/00
U.S. Cl. 361—283 5 Claims



1. In a capacitive pressure transducer of the type comprising:

first and second oppositely situated, parallel, insulative, flexible plates separated by a peripheral sealing means for forming an internal chamber therebetween, and defining pressure responsive regions in said first plate and said second plate in the areas of said plates interior to said sealing means, said plates deflecting in response to pressure applied thereto;

conductive means located on said plates within said internal chamber for forming the conducting surfaces of a pressure sensitive capacitor and for generating a capacitive signal indicative of said applied pressure, said capacitor defining a first value of capacitance at a determinable first level of applied pressure and a second value of capacitance at a determinable second level of applied pressure, wherein the first value and the second value exceed by a determinable amount the desired value of capacitance at said first and at said second pressure levels and wherein said conductive means includes a first and second conductive layer or electrode each respectively applied to the inside portion of one of said plates and located apart from and coaxial to said sealing means;

said first electrode includes at least one eccentrically located hole, such that the center of said hole is situated a distance b from the center of said first electrode, and wherein the area A of said hole is chosen to reduce said first value of capacitance to the desired value at said first level of applied pressure and wherein the distance b is chosen to reduce said second value of capacitance at said second level of applied pressure.

4,292,660

VARIABLE CAPACITOR

Tetsuo Tatsumi, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 18, 1978, Ser. No. 970,267
Claims priority, application Japan, Dec. 24, 1977, 52/174805[U]; Mar. 27, 1978, 53/39547[U]
Int. Cl.[3] H01G 5/06
U.S. Cl. 361—293 11 Claims

1. A variable capacitor, comprising:

a generally cylindrical insulating case;

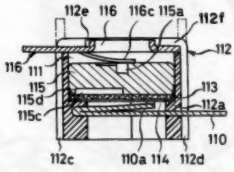
a dielectric plate non-rotatably housed in said cylindrical case and having first and second opposed main surfaces, said insulating case having a bottom inner wall surface

contacting said first main surface of said dielectric plate over a substantial area thereof such that said inner wall surface defines a structural support seat for said dielectric plate;

a stator electrode formed directly on a portion of said first main surface of said dielectric plate;

a rotor electrode rotatably housed in said cylindrical case and disposed in contact with a portion of said second main surface of said dielectric plate such that said rotor electrode is opposed to said stator electrode and is separated therefrom by said dielectric plate;

stator electrode leading-out means electrically connected to said stator electrode and extending outside said cylindrical case, said stator electrode leading-out means including a stator terminal having a resilient contact portion which is spring biased into contact with said stator electrode, said



bottom inner wall surface having a recess formed therein which accommodates said resilient contact portion such that said resilient contact portion may be spring biased into contact with said stator electrode;

rotor electrode leading-out means electrically connected to said rotor electrode and extending outside said cylindrical case; and

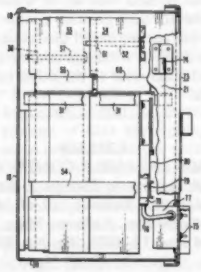
a spring member which presses said rotor electrode against said second main surface or said dielectric plate and thereby presses said dielectric plate against said bottom inner wall surface of said cylindrical case, the spring force of said spring member being higher than the spring force exerted on said stator electrode by said resilient contact portion of said stator terminal such that said dielectric member is maintained in engagement with said inner wall surface of said cylindrical case by said spring member.

4,292,661

POWER AND CONTROL SYSTEM ARRANGEMENT FOR TRANSPORT REFRIGERATION UNIT

Dannis R. Johnson, Prior Lake; Elgin J. Foster, Credit River Twp., Scott County, and Richard J. Soukup, Lakeville, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Sep. 26, 1979, Ser. No. 79,013
Int. Cl.³ H02B *1/04*
U.S. Cl. 361—393 **6 Claims**



1. A power and control system arrangement for a transport refrigeration unit which utilizes both high and low voltage for operation and control, comprising:

an enclosure having walls and an open face;

a hard-wired, electrically-passive assembly comprising a plurality of both high and low voltage terminals and both high and low voltage plug-in receptacles in the enclosure at the wall opposite the open face;

a unitary interface module having both high voltage and low voltage plugs received by said passive assembly receptacles, said interface module having both high voltage and low voltage electrically operable components, and having low voltage plug-in receptacle means;

a separate, unitary front module having low voltage plug-in means received by said low voltage plug-in receptacle means of said interface module, and carrying electrical elements of solely low voltage character;

a separate cover for the enclosure carrying electrical components including switch means controlling operation of the refrigeration unit;

wiring means detachably connecting said switch means to said front module;

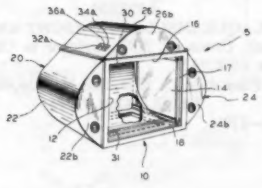
means for supporting and releasably securing said modules in stacked relation in said enclosure, with said interface module plugged in an electrically connected to said passive assembly solely by said plugged in relation, and said front module plugged in and electrically connected to said interface module solely by said plugged in relation, and said cover electrical components being electrically connected to said front module solely by said wiring means.

4,292,662

PHOTOGRAPHIC EXPOSURE CHAMBER

Eugene Gasperini, 110 W. Foster Ave., Bensenville, Ill. 60106

Filed Sep. 10, 1979, Ser. No. 74,395
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—17 **7 Claims**



1. A portable light stage comprising: an open-faced chamber, said chamber having a floor, a ceiling and sides which are translucent and interior reflective; a plurality of curved hoods, each hood covering a side and the ceiling of said chamber, said hoods having interior light reflective surfaces; an independently operable light source positioned within each of said hoods and between said hoods and said chamber whereby an object placed within said chamber can be illuminated or placed in shadows from above, behind, or from the sides as desired.

4,292,663

HIGH INTENSITY ILLUMINATION LIGHT TABLE

Ronald J. Martino, Geneva, and Alfred L. Shawcross, Lima, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Division of Ser. No. 869,968, Jan. 6, 1978, Pat. No. 4,220,982.
This application Sep. 11, 1979, Ser. No. 74,276
Int. Cl.³ G09F *13/04*
U.S. Cl. 362—97 **13 Claims**

1. A high intensity light table for transilluminating film for viewing with microscope optics, said light table comprising:

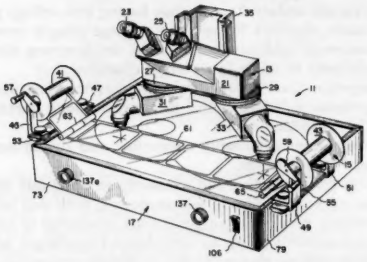
(a) housing means;

(b) a plano light transmitting surface supported by said housing means;

(c) means for producing in the plane of said light transmitting surface an annular ring of illumination which fills both the numerical aperture and the field of view of said microscope optics, said means including

(i) a reflector in the form of a surface of revolution positioned within said housing means, and

(ii) a source of high intensity illumination nominally positioned at the center of focus of said reflector whereby, when said source is energized, said reflector produces an annular image of said source;



(d) means for diffusing said annular ring of illumination to thereby eliminate both the image of said source and the scratches and other defects on a film surface which, if illuminated by non-diffused light, would be visible when viewed through said microscope optics, said diffusing means including a diffuser, located in the light path between said source and said light transmitting surface and beyond the depth of focus of said microscope optics; and

(e) means, connected to said housing means, for dimming said source.

4,292,664

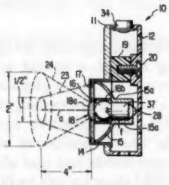
DENTAL PLAQUE DISCLOSING LIGHT AND METHOD

William Mack, Commack, N.Y., assignor to Clairol Incorporated, New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,408

Int. Cl.[3] B25K *23/18*

U.S. Cl. 362—120 **24 Claims**



1. A dental plaque disclosing light for use in conjunction with a fluorescent dye plaque disclosing solution contained in an individual's mouth, said dental plaque disclosing light comprising:

a. a casing;

b. a light source emitting only light which causes the fluorescent dye to fluoresce;

c. a power supply selectively connected to the light source for illuminating the light source;

d. a parabolic reflector supported by the casing having a focus, the light source supported in conjunction with the parabolic reflector to cause the parabolic reflector to project a solid converging cone of light; and

e. lens means supported adjacent the light source for projecting a solid, diverging cone of light having an axis concentric with the axis of the converging cone of light.

4,292,665

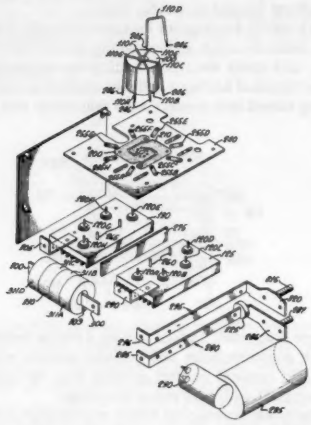
OUTPUT STAGE FOR SWITCHING REGULATED POWER SUPPLY

Wallace N. Hersom, Tustin, and John E. Crum, Mission Viejo, both of Calif., assignors to LH Research, Tustin, Calif.

Continuation-in-part of Ser. No. 908,563, May 23, 1978, Pat. No. 4,184,211. This application Jan. 14, 1980, Ser. No. 111,833

Int. Cl.[3] H02M *1/00*

U.S. Cl. 363—141 **19 Claims**



1. An output stage for a switching regulated power supply comprising:

two parallel coplanar heat sinks in close adjacent relation with one another, each said heat sink having plural fins for the dissipation of heat;

a first and second set of diodes respectively mounted on and in electrical communication with said heat sink;

a printed circuit board disposed above said heat sinks having two conductors printed thereon, each said conductor in electrical communication with one of said heat sinks;

a ferromagnetic core mounted on said printed circuit board having primary winding;

first and second sets of single turn, secondary windings on said core, each said winding comprised of a generally U-shaped wire disposed over said core so that one end of said winding extends through the interior of said core while the other end is disposed exterior of said core, said interior end and said exterior end of each secondary winding respectively connected to the terminals of one of said diodes;

said exterior end of said first set of windings connected to one terminal of said first set of diodes and said exterior end of said second set of windings attached to the opposite terminal of said second set of diodes; and

said interior end of said first set of windings connected by means of one of said printed conductors to the other terminal of said second set of diodes and said interior end of said second set of windings connected by means of the other printed conductor to the other terminal of said first set of diodes.

4,292,666

PROGRAMMABLE CONTROLLER

Lawrence W. Hill, Arlington; Thomas J. Stoodley III, Lowell, and Ronald Malcolm, Andover, all of Mass., assignors to Modicon Div. Gould Inc., Andover, Mass.

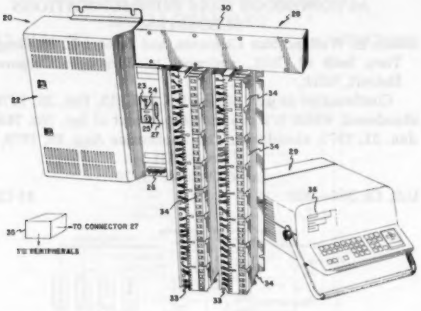
Filed Apr. 12, 1978, Ser. No. 895,581

Int. Cl.[3] G06F *15/46*

U.S. Cl. 364—104 **18 Claims**

3. An improved programmable controller of the type having

a mainframe including a central processing unit, associated electronics and memory for solving a user control program comprising a plurality of nodes in a network format, the nodes representing user selectable circuit elements that can reference other nodes, an input/output system for communicating input data from external devices to the mainframe and for transferring output data from the mainframe to the external devices for control thereof in response to the control program, and a programming panel for programming, monitoring and displaying on a cathode ray tube (CRT) at least a portion of the user selected control program, wherein the improvement comprises an improved programming panel and mainframe each having



interacting means for performing one of a plurality of search functions containing one or more search parameters as designated by the user so as to display on the programming panel CRT the control program network satisfying the search parameters, wherein the search parameters that can be designated by the user include the searching for the first node of a network, the searching for the first occurrence of a particular contact type of a particular circuit element, the searching for the first occurrence of a particular reference number, the searching for the first occurrence of a particular circuit element having a particular reference number, and the searching for the first occurrence of a particular node.

4,292,667

MICROPROCESSOR SYSTEM FACILITATING REPETITION OF INSTRUCTIONS

Robert D. Catiller, Garden Grove, and Brian K. Forbes, Huntington Beach, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 27, 1979, Ser. No. 52,687
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—200 **11 Claims**

1. A universal-type microprocessor system which cooperates with an application-dependent logic module to form a peripheral-controller capable of handling data transfers between the main memory of a host computer and a plurality of peripheral terminal units which can be either "word-oriented" or "byte-oriented", and wherein said application-dependent logic module provides external register means having bus connections to said plurality of peripheral terminal units and to said host computer, and wherein said application-dependent logic module further includes an external memory for storage of programs related to control of said peripheral terminal units and for temporary storage of data undergoing transfer, and wherein said application-dependent logic module further includes control logic means for communicating with and controlling said external register means, said external memory, and communicating with a decoder-controller in said microprocessor system, the said microprocessor system comprising:

(a) data processing means including:

(a1) an arithmetic logic unit providing an output to a shift logic circuit and to a byte-swap circuit;

(a2) said shift logic circuit providing output to an I/O bus said shift logic circuit functioning to rotate one or more bits of a word being processed, to the right or to the left;

(a3) said byte-swap circuit providing output to said I/O bus said byte-swap circuit functioning to exchange the sequential positions of the higher order byte and the lower order byte of a received two-byte word;

(b) said I/O bus providing connecting lines from said data processing means to said external registers, to said external memory, to an accumulator register means, and to an addressing means;

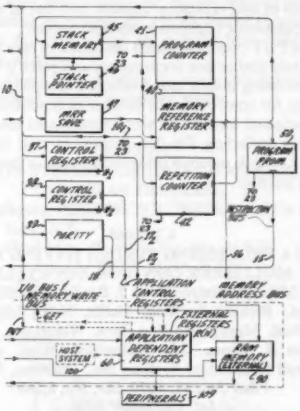
(c) addressing means receiving input data from said I/O bus and storing addresses useful for accessing data from an internal memory or said external memory storage, said addressing means including:

(c1) a program counter storing consecutive addresses of data located in said internal program memory;

(c2) a memory reference register for storing addresses of data located in said external memory, and including:

(c2-1) a memory address bus which connects to said external memory;

(c2-2) and wherein a dedicated non-address bit in said memory reference register being set to signal said decoder-controller to initiate a byte-swap operation in said byte-swap circuit, or when not-set, to pass data without a byte-swap operation;



(c2-3) a bus connection from said memory reference register to said decoder-controller;

(c3) an address register in said decoder-controller connecting by means of an address bus to said accumulator register means, which include a plurality of accumulator registers for selection of data from an addressed accumulator register;

(d) said internal program memory storage for storing program instructions and data words, said internal memory being addressed from said program counter and providing instruction words and data, via an instruction bus, to an instruction register and memory operand register;

(e) register means for temporary storage of data, said register means including:

(e1) said plurality of addressable accumulator registers which provide an output to the input of said arithmetic logic unit, said accumulator registers receiving input data words from said I/O bus;

(e2) a memory operand register for receiving operand data from said internal program memory via said instruction bus or from said external memory via a memory data bus;

(e3) an instruction register for receiving instruction words from said internal program memory via said instruction

bus and providing instruction words to said decoder-controller;

(f) said instruction decoder-controller receiving instruction signals from said instruction register and including incoming and outgoing control signal lines connected to said data processing means, to said addressing means, to said register means, to said internal and external memory means, to said external registers and said control logic means;

(f1) and wherein said decoder-controller further includes:

(f1a) connection means for receiving control signals from said control logic in said application-dependent logic module for performing clocking, interrupt, and halt functions;

(f1b) address lines to said external registers for selecting a specific register;

(f1c) control lines for strobing address signals to said external registers;

(g) said memory data bus for carrying data from said external memory to said instruction register and said memory operand register;

(h) a repitition counter having an input from said I/O bus and an output to said memory reference register;

(i) instruction word means in said internal program memory for signalling said decoder-controller, said instruction word means including:

(i-1) a GET operator which functions to place the contents of said repetition counter into one of said selected accumulator registers as its destination;

(i-2) a PUT operator which functions to take the contents of said destination accumulator and place it via said data processing means into a selected external register;

(j) means for controlling the number of repetitive operations of a selected instruction word means, said means for controlling including flip-flop means, in said decoder-controller, which receives information signals from said repetition counter.

4,292,668

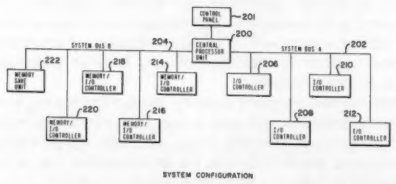
DATA PROCESSING SYSTEM HAVING DATA MULTIPLEX CONTROL BUS CYCLE

Robert C. Miller, Braintree; John J. Bradley, Framingham, both of Mass.; Richard L. King, Hollis, N.H.; Ming T. Miu, Chelmsford, Mass.; Jian-Kuo Shen, Watertown, Mass., and Theodore R. Staplin, Jr., Chelmsford, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 31, 1979, Ser. No. 8,002

Int. Cl.[3] G06F *3/00*

U.S. Cl. 364—200 **16 Claims**



SYSTEM CONFIGURATION

1. A data processing system comprising a main memory capable of storing a plurality of data words, each of said data words having a unique memory address, a central processing unit (CPU) and an input/output controller (IOC), said CPU and said IOC coupled to a common bus for the bidirectional transfer of information between said CPU and said IOC during information transfer cycles, said system further comprising:

A. first means, included in said IOC, for sending to said CPU an IOC identification signal identifying said IOC desiring to transfer a unit of data to or from said main memory;

B. second means, included in said CPU, and responsive to said IOC identification signal from said IOC, for generating an address information of where said unit of data is to be read from or written into said main memory; and

C. third means, included in said CPU, and coupled to said second means, for receiving said unit of data from said IOC and sending it and said address information to said main memory if data is to be written into said main memory, or for sending said address information to said main memory and receiving said unit of data from said main memory and sending it to said IOC if data is to be read from said main memory.

4,292,669

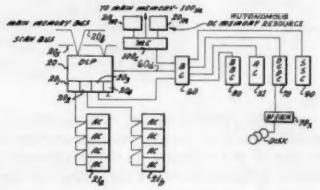
AUTONOMOUS DATA COMMUNICATIONS SUBSYSTEM

James E. Wollum, San Clemente, and Robert L. Rawlings, El Toro, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 882,213, Feb. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 764,473, Jan. 31, 1977, abandoned. This application Aug. 10, 1979, Ser. No. 65,521

Int. Cl.[3] G06F *11/20*

U.S. Cl. 364—200 **15 Claims**



1. In a data communications network having a plurality of terminals connected via transmission lines to a central station wherein said central station includes a main host system having a host processor and main memory which connects to a data communications subsystem, or to a plurality of data communications subsystems, an improved data communications subsystem comprising:

(a) a Data Communications Processor connected to said main host system for providing pointer addresses of instructions to be accessed by Front-End Controllers associated with the subsystem, said instructions being normally accessed from main memory when said main host system in on-line;

(b) a plurality of specialized Front-End Controllers for executing data-transfer operations for different speeds and line disciplines of transmission lines to peripheral terminals, each of said Front-End Controllers capable of accessing instructions from addresses in main memory or local Data Communications Memory storage means, said addresses provided by said Data Communications Processor;

(c) a Basic Control Interface providing control and communication exchange between said Data Communications Processor, a local Data Communications Memory storage means, and said Front-End Controllers;

(d) local Data Communications Memory storage means directly accessible to said Data Communications Processor and each of said Front-End Controllers, said Data Communications Memory storage means providing instructions to be accessed by said Front-End Controllers during such periods when said main host system is off-line;

(e) A Command Block located in main memory and in local Data Communications Memory for providing instructions, control, and information data for each individual Front-End Controller;

(f) and wherein said Data Communications Processor includes;

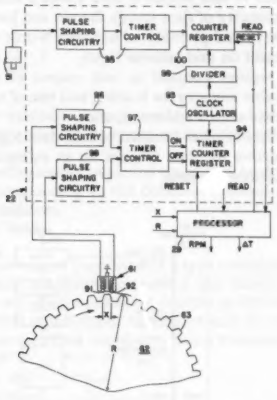
(f1) means to sense a halt or failure in said main host system and;

(f2) means to initiate continuous autonomous operation of said data communications subsystem independently of said main host system during any period when said main host system is inoperative.

4,292,670
DIAGNOSIS OF ENGINE POWER AND COMPRESSION BALANCE

David L. Reid, and Dennis O. Taylor, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 11, 1979, Ser. No. 47,066
Int. Cl.[3] G01M *15/00*
U.S. Cl. 364—431 25 Claims



10. Apparatus for diagnosing the performance of the cylinders of a multicylinder internal combustion engine, each of said cylinders having a firing interval and the intervals for all of said cylinders forming an engine cycle, comprising speed sensing means for sensing the substantially instantaneous engine speed at a plurality of angularly spaced positions in the engine cycle, and processing means responsive to said speed sensing means for squaring the engine speeds to obtain the change in a function of the kinetic energy over each of said firing intervals during a first operating condition of the engine, for squaring the engine speeds to obtain the change in the function of the kinetic energy over each of said firing intervals during a second operating condition of the engine, and for each of said intervals determining the difference between the functions of the kinetic energy.

4,292,671
DIGITAL ALTIMETER COMPUTER

James D. Evans, and Sam L. Pool, both of Houston, Tex., assignors to Hydac, Inc., Houston, Tex.

Filed Jul. 30, 1979, Ser. No. 61,928
Int. Cl.[3] G06F *15/50;* G01L *7/00*
U.S. Cl. 364—433 7 Claims

1. An apparatus for determining the altitude of an aircraft, comprising:

(a) pressure transducer means for sensing the atmospheric pressure at the aircraft's altitude and forming an output signal indicative of such pressure;

(b) means for forming a digital atmospheric pressure signal from the output signal from the pressure transducer means;

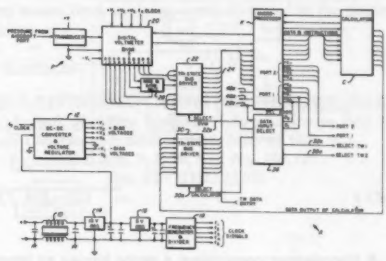
(c) ground level storing means for storing a local ground level atmospheric pressure signal;

(d) computing means for forming digital altitude signals representing the aircraft's altitude, said computer means comprising:

(1) means for storing the digital atmospheric pressure signal;

(2) means for computing, as a non-linear function of the atmospheric pressure at the elevation of the aircraft and the local ground level atmospheric pressure, digital altitude signals representing the altitude of the aircraft;

(3) means for storing the computed digital altitude signals;



(4) control means for controlling the operation of said means for computing; and

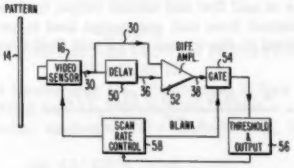
(5) data input select means for causing each of said means for storing to present the signals stored therein to said means for computing on request from said control means; and

(e) display means for indicating the computed digital altitude signal formed by said computer means.

4,292,672
INSPECTION SYSTEM FOR DETECTING DEFECTS IN REGULAR PATTERNS

Peter D. Southgate, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,822
Int. Cl.[3] G01N *33/34, 33/36*
U.S. Cl. 364—507 8 Claims



8. An inspection system for detecting defects in regular patterns wherein the elements of the patterns have variations in spatial period, said system comprising

a video sensor,

a platform movable in two directions upon which said video sensor is mounted,

a first circuit for linearizing a scan rate of said video sensor over a regular pattern, said first circuit including a first portion and a second portion parallel with said first portion, said second portion including a delay line, said first circuit further including gate means and differential amplifier means for comparing the periods of the signals in said two portions and for producing a scan rate signal related to the difference in periods, and

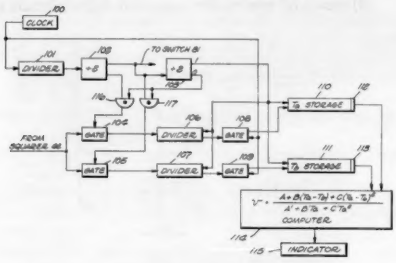
a second circuit for autocorrelating the output signal from said video sensor, said second circuit including two parallel portions one of which includes a delay line, said two parallel portions of said second circuit connected to the inputs of a differential amplifier.

4,292,673

VISCOSIMETER

Hyung Du Bae, Brea, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 10, 1980, Ser. No. 128,666
Int. Cl.³ G01N *11/02*
U.S. Cl. 364—509 **4 Claims**



1. A viscosimeter comprising: a probe having an input lead and an output lead; a loop circuit having an input lead connected from said probe output lead, a first output lead connected to said probe input lead, and a second output lead, said probe and said loop circuit forming an electromechanical oscillator, said probe including a vibratable structure immersable in a fluid, means connected from said probe input lead to vibrate said vibratable structure, a transducer, means connecting said transducer to said first and second output leads, said last named connection producing first and second varying signals on said first and second output leads, respectively both of the same frequency as that at which said vibratable structure vibrates, said first signal having periods T_a and T_b at different times, the product of the kinematic viscosity and density of said fluid being a function of said periods T_a and T_b; utilization means; output means connecting said loop circuit second output lead to said utilization means; and phase adjustment means connected to said loop circuit for periodically switching the phase of one of said first and second signals so that said one signal phase altnerates between two different values relative to the phase of the other signal, said one signal being connected from one of said first and second output leads wherein means are connected from said one output lead to provide a signal proportional to the viscosity v of said fluid thus:

$$v = \frac{A + B(T_a - T_b) + C(T_a - T_b)^2}{A' + B'T_a + C'T_a^2}$$

where

T_a is the period during which said one signal lags,

T_b is the period during which said one signal leads,

and A, B, C, A′, B′ and C′ are constants such that $A'+B'T_a+C'T_a^2$ is directly proportional to the density of said fluid.

4,292,674

ONE WORD BUFFER MEMORY SYSTEM

James H. Scheuneman, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 27, 1979, Ser. No. 61,226
Int. Cl.³ G06F *9/32*; G11C *8/00*
U.S. Cl. 364—900 **18 Claims**

1. A memory system for storing a plurality of data words at addressable locations therein, comprising:

a first address register for sequentially holding a succession of reference addresses of ones of said plurality of data words;

adder means coupled to said first address register for respectively sequentially incrementing each and every reference address of one of said plurality of said data words and providing a result of said first address plus one;

a second address register coupled to said result of said adder means for holding one plus said reference address of one of said plurality of data words;

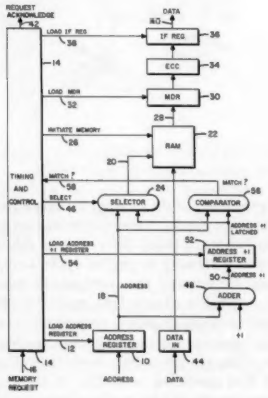
comparison means coupled to said first address register and to said second address register for comparing a second reference address when sequentially subsequently lodged in said first address register with a first reference address plus one as lodged in said second address register and providing a match output when the comparison agrees;

selector means having two inputs selectively coupled to said first address register and to said second address register and providing an output of either of said two inputs and capable of switching between said two inputs;

a randomly accessible memory having an address input coupled to said output of said selector means for storing said plurality of data words therein and having an output of one of said plurality of said data words whose address is present on said address input;

a data register coupled to said output of said randomly accessible memory for holding said one of said plurality of said data words addressed; and

an interface register coupled to said data register and communicative for data transfer to an external requestor of said memory system;



sequence control means for,

selectively upon the lack of a match output from said comparison means firstly causing said first address when and as firstly held in said first address register to be firstly selectively coupled through said selector means to said randomly accessible memory as will cause addressed data at said first address to become firstly collectively lodged in said data register and transferred to said interface register and output to said requestor,

alternatively selectively upon the existence of a match output from said comparison means firstly causing the contents of said data register to be transferred to said interface register and output to said requestor,

and always secondly causing said incremented first address from said second address register to be secondly selectively coupled through said selector means to said randomly accessible memory as will cause addressed data at said incremented first address to become secondly lodged in said data register;

whereby a second data word may be sequentially accessed from said memory system utilizing the prefetched data word as has during a prior first access become secondly lodged in said data register when said address of said

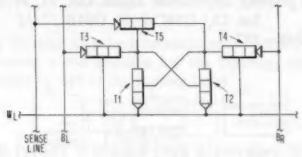
second data word is one more than the address of a first data word already accessed from said memory system.

4,292,675

FIVE DEVICE MERGED TRANSISTOR RAM CELL

Bernard A. Denis, Mennecy, France, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 30, 1979, Ser. No. 61,973
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—156 **7 Claims**



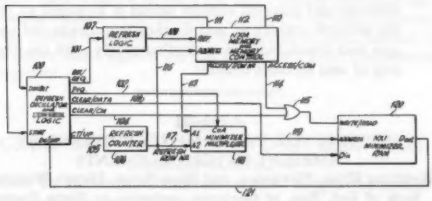
1. A bipolar transistor memory array cell, each transistor of said cell having collector, base and emitter, said cell comprising:
- a pair of flip-flop cross-connected transistors having a pair of nodes corresponding to the collectors of said cross-connected transistors,
- a pair of bit lines,
- a word line,
- a pair of input-output transistors of a type complementary to said flip-flop transistors connecting said nodes to said bit lines via the emitter-collector current paths thereof, the bases of said input-output transistors and the emitters of said cross-connected transistors being connected to said word line,
- a sense line, and
- a sense transistor,
- the collector of said sense transistor being connected to one of said nodes;
- the base of said sense transistor being connected to the other of said nodes, and
- the emitter of said sense transistor being connected to said sense line.

4,292,676

REFRESH CYCLE MINIMIZER IN A DYNAMIC SEMICONDUCTOR MEMORY

Sammy S. Henig, Clifton, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Nov. 15, 1978, Ser. No. 960,874
Int. Cl.² G11C *8/00*
U.S. Cl. 365—222 **5 Claims**



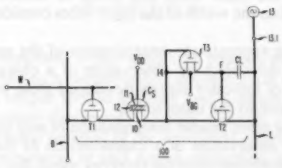
1. A refresh circuit for an N×M dynamic semiconductor memory comprising:
- means for identifying rows in the N×M memory requiring the application of a refresh signal thereto,
- means for periodically applying refresh signals to the N×M memory rows identified by the identifying means,
- an N×1 auxiliary memory, having N storage locations, the number of storage locations corresponding to the number of rows in the N×M memory,
- means for detecting access, for the storage and retrieval of information, to a predetermined N×M memory row,
- means responsive to the detecting means for storing a control bit in the N×1 memory at a storage location corresponding to the predetermined row in the N×M memory, and
- means responsive to the presence of a control bit in said N×1 memory storage location for preventing the applying means from applying a refresh signal to the predetermined row.

4,292,677

SELF-REFRESHED CAPACITOR MEMORY CELL

Harry J. Boll, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 7, 1980, Ser. No. 109,777
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—222 **4 Claims**



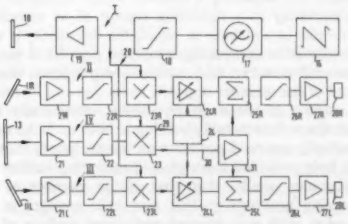
1. Semiconductor apparatus including a network for refreshing the memory state of a semiconductor capacitor memory cell (C_S) comprising a first transistor (T_2), one of whose high current carrying terminals is DC coupled to one terminal of the capacitor, and another of whose high current terminals is DC coupled to a refresh line terminal (13.1), characterized in that, a low current carrying terminal of the first transistor (T_2) is DC coupled to one terminal of a two-terminal threshold resistive element (T_3 or R) whose other terminal is DC coupled to said one terminal of the first transistor (T_2).

4,292,678

METHOD OF AND APPARATUS FOR ECHO LOCATION OF OBJECTS

Leslie Kay, 82 Scarborough Rd., Christchurch 8, New Zealand

Filed Aug. 13, 1979, Ser. No. 65,880
Claims priority, application New Zealand, Aug. 14, 1978, 188126
Int. Cl.³ G01S *15/34, 15/88*
U.S. Cl. 367—102 **15 Claims**



1. In a method of providing information as to the existence and/or position of an object otherwise than by direct vision, including the steps of radiating wave energy (herein called the transmitted signal) from a station to a field of view, receiving at the station at least part of the transmitted signal (such part

being herein called the received signal) reflected from the object, carrying out a frequency modulation of the transmitted signal to produce a frequency difference between the received signal and a correspondingly frequency modulated locally generated signal in a mode such that the magnitude of the frequency difference represents the range of the object from the station, operating upon the received signal with the locally generated signal to produce a range signal of said difference frequency, and determining or sensing the angular position of the object with respect to a reference axis extending through the station and the field of view by observation of a characteristic of the received signal and which is dependent upon the angular position of the object, the improvement comprising the further steps of:

a. establishing, in respect of the received signal, respective directional receptivities, herein called the outer lobes, defined by receiving polar diagrams having maxima spaced apart angularly on opposite sides of the reference axis,

b. establishing a further directional receptivity, herein called the inner lobe, defined by a further polar diagram having a maximum lying angularly between the respective maxima of the outer lobes and being of narrower angular width than the width of the outer lobes considered collectively,

c. effecting approximate determination of the angular position of the object by observation of a characteristic in respect of indicator signals developed from the received signals due to the outer lobes,

d. effecting more precise determination of said angular position by observation of a characteristic of the indicator signal developed from the received signal due to the inner lobe.

4,292,679

VARIABLE DIRECTIVITY MOUNTING MEANS

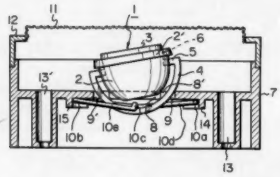
Mikio Kondo, Tsu; Hiromitsu Inoue, Kyoto, and Hiroshi Ohashi, Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 7, 1980, Ser. No. 110,103

Claims priority, application Japan, Jan. 10, 1979, 54-1654[U]

Int. Cl.³ H04B *11/00*

U.S. Cl. 367—188 **7 Claims**



1. In a means for mounting a member which functions with a desired directivity to a mounting station of an associated device or the like in a manner in which the directivity is variable, the combination comprising a tapered peripheral surface provided on said member, said surface being tapered toward the other end of the member opposite to its one end forming a functional surface of the member, means substantially of a semi-arcuate shape for rotatably bearing at both ends the member at diametrally opposed positions on the periphery thereof, a mounting hole provided through said mounting station and having a diameter smaller than that of the member at said opposed bearing positions so that said hole engages at the peripheral edge with said tapered peripheral surface of the member, a pair of grooves for allowing arcuate body of said bearing means to be freely engaged therein, said grooves being provided in the mounting station to communicate with said hole at diametrally opposed positions of the periphery of the hole, and a resilient means slidably engaged with said arcuate body of the bearing means for providing through the bearing means to the member a force with which the tapered peripheral surface of the member is resiliently urged into said engagement with the peripheral edge of the hole.

4,292,680

ELECTRONIC TIMEPIECE

Shigeru Morokawa, Higashiyamato; Fukuo Sekiya, Tokorozawa; Yukio Hashimoto, Ishigami-Niiza; Yasushi Nomura, and Keiichiro Koga, both of Tokorozawa, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

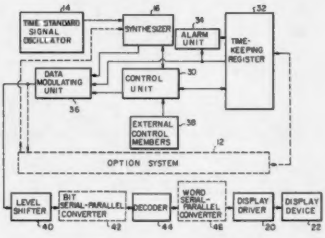
Division of Ser. No. 626,791, Oct. 29, 1975, Pat. No. 4,150,535.

This application Sep. 15, 1978, Ser. No. 943,262

Claims priority, application Japan, Oct. 31, 1974, 49/125801

Int. Cl.³ G04C *9/00*; G04B *17/12*

U.S. Cl. 368—187 **8 Claims**



1. An electronic timepiece comprising:

a frequency supply for providing a relatively high frequency timebase signal;

a frequency converter responsive to said timebase signal for providing a relatively low frequency time unit signal;

timekeeping means responsive to said time unit signal for providing current time information;

means for correcting said current time information;

display means for displaying said current time information;

command means for generating a calculation command signal;

circuit means enabled by said calculation command signal to produce, in response to said time unit signal a frequency error signal indicative of an error in the frequency of said time unit signal;

means for generating a gain/loss adjustment signal in response to said frequency error signal;

frequency adjusting circuit means for adjusting the frequency of said time unit signal in response to said gain/-loss adjustment signal; and

external control means responsive to actuation for

generating said calculation command signal; wherein said timekeeping means includes a seconds counter, and wherein said external control means is arranged to reset the seconds counter of said timekeeping means and energize said command means simultaneously with the resetting of said seconds counter.

4,292,681

HOUSING FOR INSTRUMENTS POWERED BY AMBIENT OXYGEN ELEMENTS

Wolfgang Kloss, Ellwangen, and Hans Sauer, Idstein-Walsdorf, both of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 16, 1979, Ser. No. 3,985

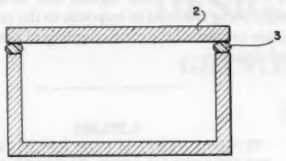
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1978, 2804205

Int. Cl.³ G04B *37/00*; H01M *12/06*

U.S. Cl. 368—280 **6 Claims**

1. A housing for completely enclosing an electrical instrument and the ambient oxygen cell by which it is powered, said

housing comprising two separate but interconnected gas-impermeable portions and a sealing body positioned at the interconnection between said housing portions, the sealing



body being formed of a hydrophobic microporous substance and constituting a gas passage for the housing, the housing being gas tight except at the sealing body.

4,292,682

WATER-TIGHT WINDER FOR A DIVER'S WATCH

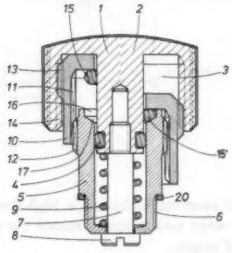
Karl Wenger, Chambesy-Geneva, Switzerland, assignor to Boninchi, S.A., Geneva, Switzerland

Filed Mar. 26, 1980, Ser. No. 134,061

Claims priority, application Switzerland, Mar. 29, 1979, 2913/79

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—289 **3 Claims**



1. A water-tight push-piece for a diver's watch comprising a recessed head provided with an axially extending core, a rod unitary with said core, a tube in which the rod is mounted and which is intended to be secured to a watch case, a return spring located between the tube and the head, a first gasket between said core and the tube, means for locking the push-piece in an inoperative position and comprising a sleeve having a base and mounted inside the head around the tube, which sleeve is prevented from rotating but is able to slide axially on the tube and defines externally a screw thread cooperating with an internal screw-thread defined by the head in order to move axially upon rotation of the head, and a second gasket located between the base of the sleeve and an end of the tube whereby, in the locked inoperative position of the push-piece, the base of the sleeve abuts against the end of the tube thus compressing the gasket.

4,292,683

GUARD BAND REDUCTION IN OPEN LOOP TDMA COMMUNICATIONS

Robert R. Jueneman, Gaithersburg, Md., assignor to Satellite Business Systems, McLean, Va.

Filed Nov. 6, 1979, Ser. No. 92,242

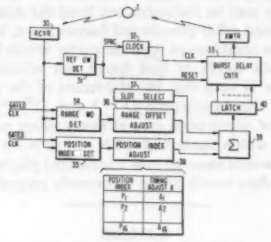
Int. Cl.³ H04J *3/06*

U.S. Cl. 370—104 **5 Claims**

1. In an open loop TDMA communication system including a reference station, a transponder located on board a spacecraft in quasi-synchronous earth orbit and a plurality of geographically separated stations, in which said reference station periodically transmits a timing marker through said transponder, from which each of said stations derive TDMA transmit timing, apparatus to reduce inter-burst guard time required as a result of spacecraft motion comprising:

means for transmitting, through said transponder, a spacecraft position index signal,

and TDMA transmit timing adjusting means, at a plurality of said stations, each of said TDMA transmit timing adjusting means including receiving means for receiving said spacecraft position index signal,



means responsive to said spacecraft position index signal for determining a corresponding position index timing adjustment unique to said stations, said position index timing adjustment determined by said position index and the geographic location of the associated station, and

means responsive to said timing adjustment for effecting a corresponding advancement or retardation of station TDMA transmit timing.

4,292,684

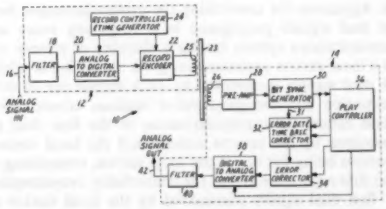
FORMAT FOR DIGITAL TAPE RECORDER

Michael J. Kelly, Erin Prairie Township, St. Croix County, Wis., and Robert J. Youngquist, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 956,581, Nov. 1, 1978, abandoned. This application Oct. 15, 1979, Ser. No. 81,880

Int. Cl.³ G06F *11/12*; G11B *27/00*

U.S. Cl. 371—38 **12 Claims**



1. A circuit for processing digital signals to be recorded on a single track of a suitable record medium, said circuit comprising

means for encoding said digitized signal into a serialized signal suitable for recording on said record medium, said serialized signal containing a succession of frames in which each frame comprises a preselected number of data words, a preselected number of parity words, an error check code word corresponding to the frame and a sync word defining the frame location, said encoding means including means for generating the parity words of each frame by an exclusive −OR combination of data words of at least two other preselected frames according to the expression:

$$P_K{}^N = D_{K+j^{(N-m)}} \oplus D_{K+k^{(N+n)}}$$

where

P_K^N is a given parity word located at segment K of frame N,

$D_{K+J}^{(N+n)}$ is a given data word located at segment K+j of another preselected frame N+n located N frames ahead of frame N, where J is an integer,

$D_{K+k}^{(N-m)}$ is a given data word located at segment K+k of yet another preselected frame N−m, located m frames in back of frame N, where K is an integer, k is an integer, and m and n are integers not equal to 0, whereby each frame which is incorrectly played back may be detected, correct data words of that frame may be reconstructed from the data words of at least one of said other preselected frames N+n, located ahead of frame N in combination with the parity words P_K generated from the data words of that frame and which are located behind frame N such that the placement of the parity words P_K between the data words D^{N+n} and D^{N-m} ensures the availability of correctable data at every given position along the medium within the bounds of N−m to N+n and the corrected data words inserted into a serialized playback signal in place of the data words of the incorrectly played back frame.

4,292,685

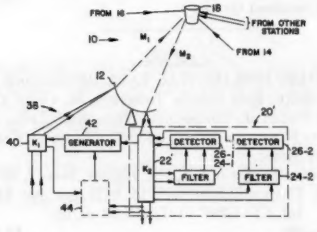
APPARATUS AND METHOD FOR CONTROLLING CROSSPOLARIZATION OF SIGNALS IN A FREQUENCY REUSE SYSTEM

Lin-Shan Lee, P.O. Box 5874, Stanford, Calif. 94305

Filed May 31, 1978, Ser. No. 911,954

Int. Cl.³ H04B 7/155, 7/185, 15/00

U.S. Cl. 455—12 **12 Claims**



4. Apparatus for controlling the crosspolarization between first dual signals propagated in a frequency reuse satellite communications system having a plurality of remote stations and a local station communicating via a satellite, in which the first dual signals transmitted by each station are of different polarization and the propagative medium around the local station causes the crosspolarization of the first dual signals transmitted by the remote stations and the local station, the apparatus being for use at the local station, comprising:

(a) first adjustable means for controllably crosscoupling the first dual signals transmitted by the local station to the satellite to compensate for the crosspolarization due to the propagative medium;

(b) second adjustable means for controllably crosscoupling the first dual signals received by the local station via the satellite to compensate for the crosspolarization due to the propagative medium; and

(c) closed-loop control means for transmitting second dual-polarized reference signals via said first adjustable means and through the propagative medium, and for receiving the transmitted reference signals through the propagative medium and via said second adjustable means, said second adjustable means being adjusted in response to the received reference signals to control the crosscoupling of the received first dual signals and said first adjustable means being adjusted in response to the received reference signals to control the crosscoupling of the transmitted first dual signals.

4,292,686

TUNING SYSTEM FOR RECEIVER OF PILOT-MODULATED CARRIER WAVES

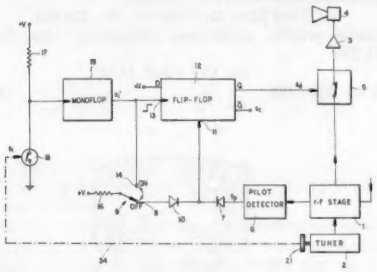
Ernst O. Pagel, Böhmfeld, and Robert Harth, Wettstetten, both of Fed. Rep. of Germany, assignors to Audi NSU Auto Union AG, Neckarsulm, Fed. Rep. of Germany

Filed May 30, 1979, Ser. No. 43,849

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1978, 2824006

Int. Cl.³ H04B 1/10

U.S. Cl. 455—194 **10 Claims**



1. In a radio receiver including a high-frequency stage, a low-frequency stage and coupling means for releasably interconnecting said stages,

the combination therewith of:

tuning means connected to said high-frequency stage for adjusting same to pick up incoming carrier waves modulated by a pilot frequency;

detector means connected to said high-frequency stage for emitting an enabling signal only in the presence of said pilot frequency;

sensing means operatively coupled with said tuning means for generating an interrupt signal in response to manipulation of said tuning means; and

bistable means with input connections to said detector means and to said sensing means and with an output connection to said coupling means for switching to a first state interconnecting said stages in response to said enabling signal and for switching to a second state disconnecting said low-frequency stage from said high-frequency stage only upon coincidence of said interrupt signal with an absence of said enabling signal, said bistable means being unswitchable from said first state by the disapperance of said enabling signal in the absence of said interrupt signal whereby said stages remain interconnected at least until the next manipulation of said tuning means.

DESIGN PATENTS

GRANTED SEP. 29, 1981

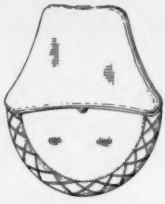
ERRATA

For CLASS	See PATENT NO.
D32–049	260,959

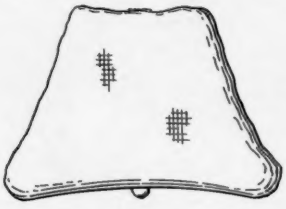
DESIGNS

SEPTEMBER 29, 1981

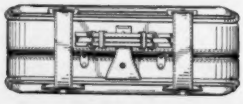
260,945
NECKTIE FOR FORMAL ATTIRE
Gaetano Leonardi, 452 69th St., Brooklyn, N.Y. 11220
Filed Nov. 5, 1979, Ser. No. 90,908
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—343

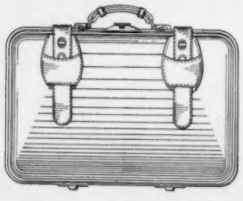


260,946
NECKTIE FOR FORMAL ATTIRE
Gaetano Leonardi, 452 69th St., Brooklyn, N.Y. 11220
Filed Nov. 5, 1979, Ser. No. 91,591
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—343

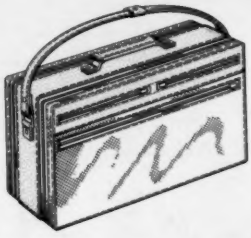


260,947
LUGGAGE CASE
Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Aug. 4, 1978, Ser. No. 931,113
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

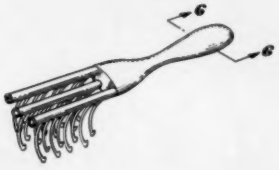




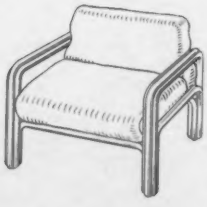
260,948
LUGGAGE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.
Filed Apr. 2, 1979, Ser. No. 25,808
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71



260,949
HAIR BRUSH
Salvatore J. Megna, 3721 Fair Oaks Blvd., Sacramento, Calif. 95825
Filed Nov. 23, 1979, Ser. No. 96,666
Term of patent years
Int. Cl. D4—*02*
U.S. Cl. D4—35

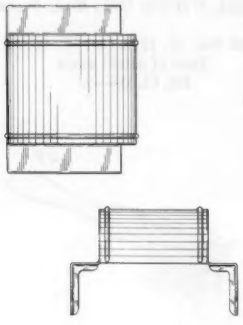


260,950
SEAT OR SIMILAR ARTICLE
Gae Aulenti, Milan, Italy, assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 827,609, Aug. 25, 1977. This application Mar. 24, 1980, Ser. No. 133,657
Term of patent years
Int. Cl. D6—*01*
U.S. Cl. D6—73

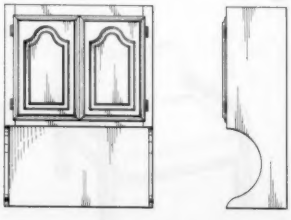


260,951
PLATFORM WATERBED
Michael D. Paripovich, and Donald R. Kendall, both of Chickasha, Okla., assignors to CMF Mattress Company, Chickasha, Okla.
Filed Jan. 10, 1980, Ser. No. 111,177
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79

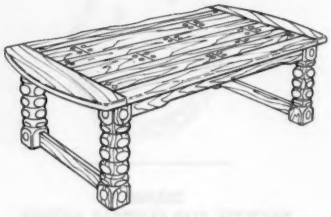
260,952
TOILET TISSUE COVER
Michael A. Perez, 5825 Glenis St., Taylor, Mich. 48180
Filed Mar. 3, 1980, Ser. No. 126,812
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—86



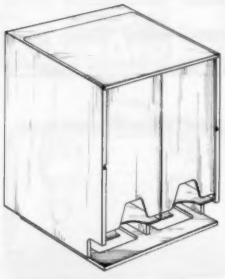
260,953
MEDICINE CABINET
Donald R. Patterson, 2509 Jackson, Joplin, Mo. 64801
Filed Apr. 4, 1980, Ser. No. 137,118
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—104



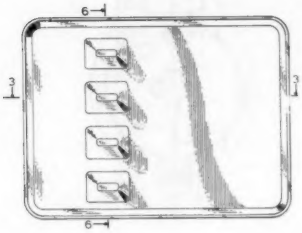
260,954
TABLE
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Feb. 12, 1979, Ser. No. 11,196
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



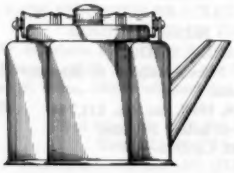
260,955
MODULAR SUTURE CABINET BOX
Michael Schuler, Edison; Harvey B. Mandel, North Brunswick, and John E. Studer, Flemington, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.
Filed Jul. 19, 1978, Ser. No. 926,064
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186

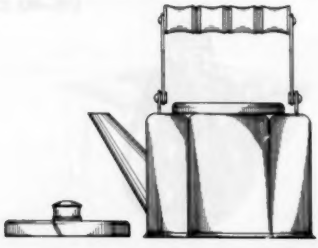


260,956
SERVING TRAY
Stephen D. DesMarais, R.R. 2, Staples, Minn. 56479
Filed Mar. 19, 1979, Ser. No. 21,560
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38

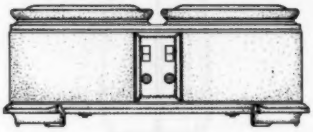


260,957
TEA KETTLE OR SIMILAR ARTICLE
Joy C. Urich, New York, N.Y., assignor to M. Kamenstein, Inc., White Plains, N.Y.
Filed Dec. 1, 1978, Ser. No. 965,658
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—60

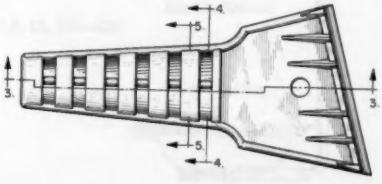




260,958
DOUBLE WELL SLOW COOKER
Hideo Nishikawa, Osaka, Japan, assignor to Imanishi Flexible Tube Mfg. Co., Ltd., Japan
Filed Nov. 29, 1977, Ser. No. 855,746
Claims priority, application Japan, Jul. 15, 1977, 52-28059
Term of patent 7 years
Int. Cl. D7—*02*
U.S. Cl. D7—94

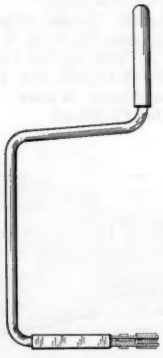


260,959
ICE SCRAPER
Randall T. Schnarr, Toronto, Canada, assignor to American Home Products Corporation, New York, N.Y.
Filed Aug. 30, 1979, Ser. No. 71,250
Claims priority, application Canada, Mar. 15, 1979, 1503799
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—49

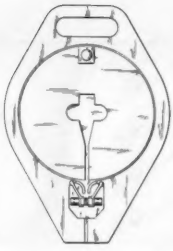


260,960
TELESCOPING PLANT STAKE
John G. Malia, Jr., 2295 Pinon Rd., Rescue, Calif. 95672
Filed Feb. 5, 1979, Ser. No. 9,161
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—1

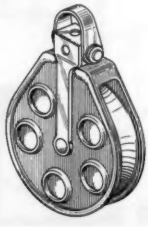
260,961
RATCHET WRENCH HANDLE
David J. Leehaug, West Chicago, Ill., assignor to Maremont Corporation, Chicago, Ill.
Filed Dec. 8, 1978, Ser. No. 967,616
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—107



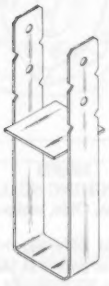
260,962
HOSE REEL
Valentine Hechler, IV, Northfield, Ill., assignor to Injecto Mold, Inc., Chicago, Ill.
Filed Jan. 24, 1979, Ser. No. 5,951
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—359



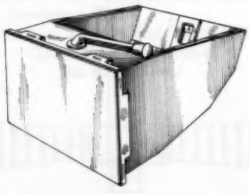
260,963
MARINE BLOCK
Carl A. Merry, Marion, Mass., assignor to Schaefer Marine, Inc., New Bedford, Mass.
Filed Jan. 14, 1980, Ser. No. 111,764
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D8—360



260,964
CONNECTOR FOR WOOD MEMBERS
Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.
Filed Oct. 10, 1978, Ser. No. 950,090
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—373

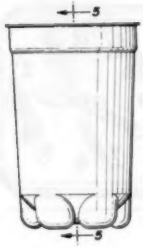


260,965
VACUUM MOUNTED BRACKET FOR ELECTRONIC EQUIPMENT OR THE LIKE
Jerry W. Harrison, 5505 Vagas St., Rowlett, Tex. 75088; James D. Koncak, 8835 Arborside Dr., Dallas, Tex. 75231, and Frank E. Kline, 3100 Richmond Ave. Ste. 103, Houston, Tex. 77098
Filed Mar. 26, 1979, Ser. No. 23,717
Term of patent 14 years
Int. Cl. D8—*08;* D3—*99;* D12—*16;* D14—*10*
U.S. Cl. D8—373



260,966
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed May 17, 1979, Ser. No. 39,922
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—349

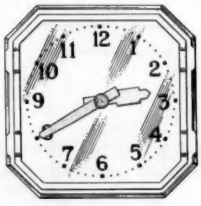
260,967
CONTAINER FOR LIQUIDS
Harold E. Taylor, Leeds, England, assignor to Plastona (John Waddington) Limited, Leeds, England
Filed Dec. 1, 1978, Ser. No. 965,655
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—355



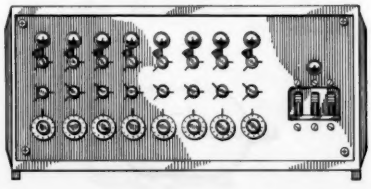
260,968
PACKAGING CONTAINER FOR OIL OR THE LIKE
Piero Pavia; Massimo Pavia, and Giorgio Pavia, all of Via Biglia 2, 16100 Genoa, Italy
Filed Nov. 17, 1978, Ser. No. 961,751
Claims priority, application Italy, May 17, 1978, 21885/78[U]
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—428

260,969
STOPPER
Michael K. Goettner, Sylvania, and James E. Plummer, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Jun. 21, 1979, Ser. No. 50,711
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—439

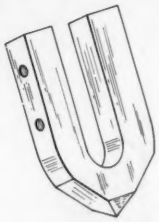
260,970
WRISTWATCH
Jean Dinh Van, 15, Place Gaillon, 75002 Paris, France
Filed Mar. 19, 1979, Ser. No. 21,680
Claims priority, application Switzerland, Sep. 19, 1978, 67543/78
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39



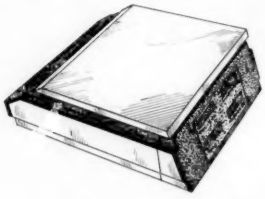
260,971
TEMPERATURE CONTROL APPARATUS
Richard Littlefield, P.O. Box 285, Kennebunk, Me. 04043
Filed Jul. 5, 1979, Ser. No. 54,936
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50



260,972
BACKHOE DEPTH GAUGE
Larry C. Sharpe, 319 Olean, Hayward, Calif. 94544
Filed Mar. 19, 1979, Ser. No. 22,073
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70

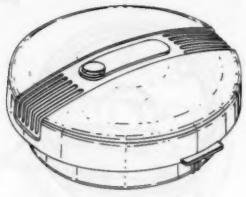


260,973
WEIGHING SCALE
Edward Lawing, Columbus, Ohio, assignor to Reliance Electric Co., Cleveland, Ohio
Filed Aug. 30, 1979, Ser. No. 71,314
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

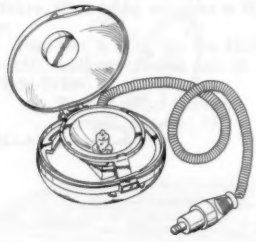


260,974
SAMPLING DEPTH BOB
N. Lewis Lesser, 536 Ridgewood Ave., Glen Ridge, N.J. 07028
Filed Oct. 25, 1979, Ser. No. 87,999
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—101

260,975
FIRE ALARM
Yanta H. T. Lam, Kowloon, Hong Kong, assignor to Meyer Aluminum Ltd., Kowloon, Hong Kong
Filed Jun. 25, 1979, Ser. No. 52,016
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



260,976
AUTOMOTIVE EMERGENCY LAMP
Oskar H. Emmerling, Feldkirchen, and Horst Ehlebracht, Enger, both of Fed. Rep. of Germany, assignors to OSRAM GmbH, Munich and Berlin, Fed. Rep. of Germany
Filed Dec. 14, 1978, Ser. No. 969,385
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1978, 11429
Term of patent 14 years
Int. Cl. D10—*06;* D26—*02*
U.S. Cl. D10—114

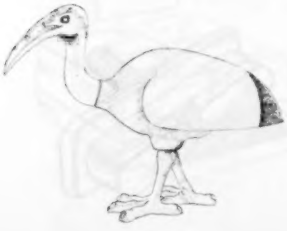


260,977
WATCH STRAP
William F. Rimmler, West Warwick, R.I., assignor to Garstan Corporation, Providence, R.I.
Filed Nov. 27, 1978, Ser. No. 965,249
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

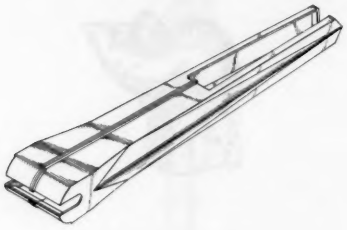
260,978
FIGURINE OF A MOUSE
Jesus A. C. Santa Eulalia, and Javier B. C. Santa Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Sep. 29, 1978, Ser. No. 946,826
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

260,979
FIGURINE OR THE LIKE
John O. Van Koert, Wilson, N.C. 27893
Filed Oct. 31, 1979, Ser. No. 89,864
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

260,980
BIRD STATUETTE OR THE LIKE
John O. Van Koert, Wilson, N.C. 27893
Filed Oct. 31, 1979, Ser. No. 89,865
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

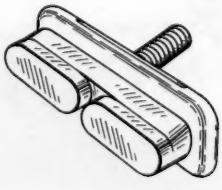


260,981
COVER FOR WRECKER BOOMS
Harold F. Carr, Jr., Hixson, Tenn., and David F. Humphries, Lafayette, Ga., assignors to Dover Corporation/Ernest Holmes Division, Chattanooga, Tenn.
Filed Jun. 26, 1978, Ser. No. 918,931
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—14



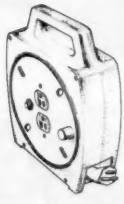
260,982
AIR FILTER FOR A MOTORCYCLE
Henry R. Ortiz, 1017 Madison St., Delano, Calif. 93215
Filed Jun. 11, 1979, Ser. No. 47,288
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114

260,983
BRAKE SHOE
Richard C. Everett, 225 S. Sunshine La., West Linn, Oreg. 97221
Filed Jan. 17, 1979, Ser. No. 4,026
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—180

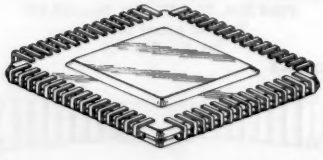


260,984
AUTOMOBILE WHEEL COVER
Ralph E. Jonsson, Hasselkullegatan 114, S–461 00 Trollhättan, Sweden
Filed Dec. 7, 1978, Ser. No. 967,618
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

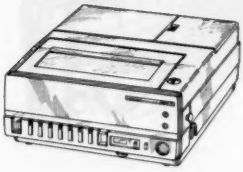
260,985
CORD REEL
John Moylan, Tillsonburg, Canada, assignor to Fleck Manufacturing Company, Tillsonburg, Canada
Filed Jun. 15, 1979, Ser. No. 48,885
Claims priority, application Canada, Apr. 4, 1979, 04-04-79
Term of patent 14 years
Int. Cl. D8—*99;* D13—*03;* D22—*05*
U.S. Cl. D13—30



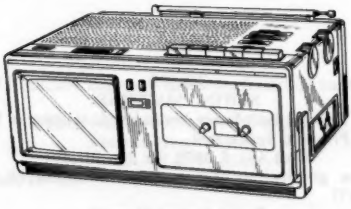
260,986
SEMICONDUCTOR
Hidetoshi Mochizuki, Fuchu; Keizo Otsuki, Higashiyamayo; Hideki Kosaka, Kodaira, and Gen Murakami, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 26, 1979, Ser. No. 15,159
Claims priority, application Japan, Aug. 25, 1978, 53-35731
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—99

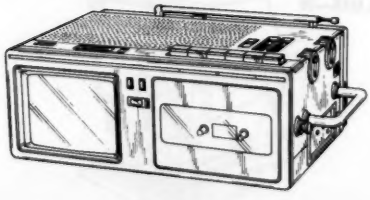


260,987
VIDEO TAPE RECORDER
Masaaki Furukawa, Sagamihara; Michiko Nishibayashi, Tokyo, and Noboru Onozaki, Ohmorinishi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 26, 1979, Ser. No. 52,202
Claims priority, application Japan, Jan. 8, 1979, 54-62
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2



260,988
COMBINED CASSETTE TAPE RECORDER, RADIO AND TELEVISION RECEIVER
Akira Takahashi, Tokyo; Shunji Fujimori, Akishima, and Takeshi Abe, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 9, 1979, Ser. No. 82,933
Claims priority, application Japan, Apr. 16, 1979, 54-14986; Jul. 27, 1979, 54-31280
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5



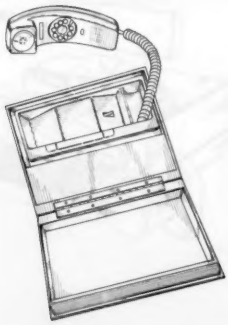


260,989
MICROPHONE
Michael J. McGourty, Littleport, England, assignor to Pye Electronics Products Limited, Cambridge, England
Filed Nov. 14, 1978, Ser. No. 960,529
Claims priority, application United Kingdom, May 19, 1978, 984679/78; May 19, 1978, 984680/78; May 19, 1978, 984681/78
Term of patent 14 years
Int. Cl. D14—*03, 01*
U.S. Cl. D14—12

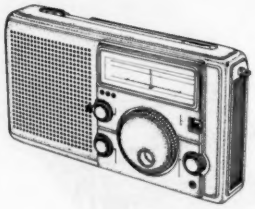
260,990
STORE DATA ENTRY TERMINAL
Roger C. Williams, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Dec. 19, 1978, Ser. No. 971,144
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—105

260,991
TELEPHONE SET
Luigi Bandini-Buti, and Marco Del Corno, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy
Filed Jul. 28, 1978, Ser. No. 929,028
Claims priority, application Italy, Feb. 3, 1978, 35592 A/78
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

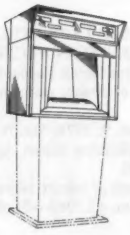
260,992
PHONE BOOK TELEPHONE
Martin Feinberg, Fort Lee, and William G. MacKenzie, Matawan, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Aug. 9, 1978, Ser. No. 932,393
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



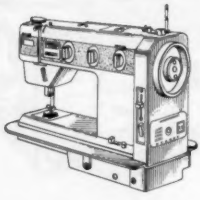
260,993
RADIO RECEIVER
Takeyoshi Kawano, Kyoto, and Teruyuki Nishimoto, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 6, 1978, Ser. No. 940,642
Claims priority, application Japan, Mar. 10, 1978, 53-9276
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



260,994
GASOLINE DISPENSING PUMP
Fred C. Resh, Bensalem, Pa., assignor to The Standard Oil Company, Cleveland, Ohio
Filed Sep. 15, 1980, Ser. No. 187,295
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9.1



260,995
SEWING MACHINE
Marcel Fresard, Petit-Lancy, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland
Filed Aug. 5, 1977, Ser. No. 822,280
Claims priority, application Switzerland, Feb. 8, 1977, 109013/77
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—70



260,996

DISPENSER CABINET

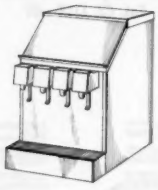
Donald F. Cornett, Cartersville, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 4, 1980, Ser. No. 127,210

Term of patent 14 years

Int. Cl. D15—*08*

U.S. Cl. D15—116



260,997

CAMERA WITH INTEGRATED FLASH

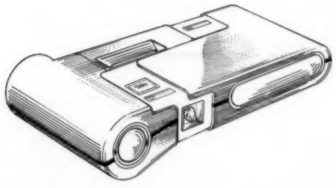
James T. Asaki, Middletown, and William G. MacKenzie, Matawan, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 3, 1978, Ser. No. 930,770

Term of patent 14 years

Int. Cl. D16—*01*

U.S. Cl. D16—06



260,998

MICROFICHE READER

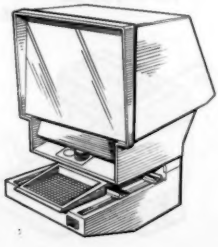
Peter J. Hall, 274 Burton Ave., Barrie, Ontario, Canada (L4N 2S2)

Filed Jun. 18, 1979, Ser. No. 49,231

Term of patent 14 years

Int. Cl. D16—*02*

U.S. Cl. D16—14



260,999

PHOTOGRAPHIC ENLARGEMENT PRINTER

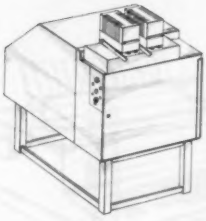
Sam Schwartz, Los Angeles, Calif., assignor to Post-R-Matic, Inc., Marina del Rey, Calif.

Filed Nov. 27, 1978, Ser. No. 963,911

Term of patent 14 years

Int. Cl. D16—*03*

U.S. Cl. D16—28



261,000

CAMERA WITH STROBO

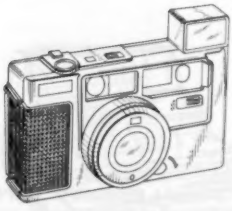
Yuzo Miura, Tokyo, and Mutsuhide Matsuda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1979, Ser. No. 52,988

Term of patent 14 years

Int. Cl. D16—*01*

U.S. Cl. D16—42



261,001

VIEWING AND ANGLING DEVICE FOR ICE FISHING

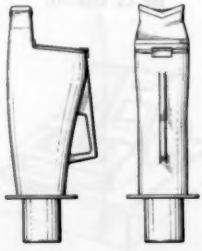
Dennis C. Michaels, 114 First Ave. N.E., Buffalo, Minn. 55313, and John W. Michaels, Box 6 - 7612 Huron, Chanhassen, Minn. 55317

Filed Feb. 12, 1979, Ser. No. 11,515

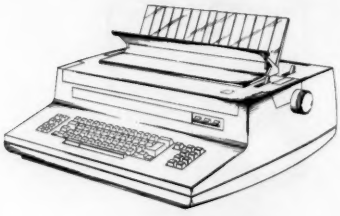
Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—130



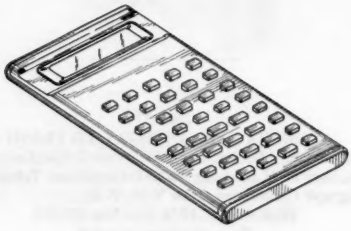
261,002
TYPEWRITER OR THE LIKE
Vincent Giannotti, Jr., Austin, Tex.; Henry Kapper, Raleigh, N.C., and Edward J. Sabella, Georgetown, Tex., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Oct. 30, 1978, Ser. No. 956,012
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



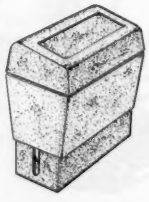
261,003
CASH REGISTER
Katsumi Jinbo, and Junichi Sakamoto, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 3, 1978, Ser. No. 893,178
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—4

261,004
CASH REGISTER
Katsumi Jinbo, and Junichi Sakamoto, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 16, 1978, Ser. No. 907,180
Claims priority, application Japan, Nov. 22, 1977, 52-46240
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—4

261,005
CASE FOR AN ELECTRONIC CALCULATOR
Shinpei Ichikawa, and Robert A. Welch, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation-in-part of Ser. No. 923,859, Jul. 12, 1978, and Ser. No. 924,038, Jul. 12, 1978. This application Aug. 21, 1978, Ser. No. 935,213
The portion of the term of this patent subsequent to May 12, 1985, has been disclaimed.
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



261,006
SELF-INKING STAMP
Alexander C. Wall, Nokomis, Fla., and Leonard H. Sculler, Englishtown, N.J., assignors to M & R Seal Press Co., Inc., Roselle, N.J.
Filed Dec. 21, 1979, Ser. No. 106,090
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D18—15

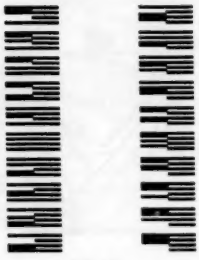


261,007

BAR CODE SYMBOLS

Barry E. Passer, Ithaca, and George A. Sculley, Endicott, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed May 14, 1979, Ser. No. 38,999
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—26



261,008

SHEET LIFTER FOR A LOOSE LEAF RING BINDER

Theodore C. Mizejewski, Chicopee, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.

Filed Aug. 9, 1979, Ser. No. 65,115
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—32

261,009

PEN

Francine Gomez, Paris, France, assignor to Waterman, S.A., Paris, France

Filed Sep. 11, 1979, Ser. No. 74,329
Claims priority, application France, Mar. 16, 1979, 79 77412
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

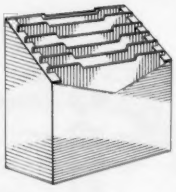
261,010

PEN OR SIMILAR ARTICLE

Kunio Itoh, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan

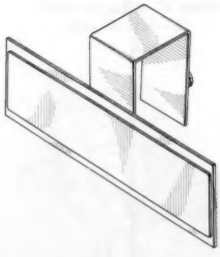
Filed Oct. 9, 1979, Ser. No. 82,622
Claims priority, application Japan, May 15, 1979, 54-19567
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

261,011
DESK TOP FILE
Gary Brown, 3251 SW. 11 Ave., Ft. Lauderdale, Fla. 33335
Filed Oct. 17, 1979, Ser. No. 85,694
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—90

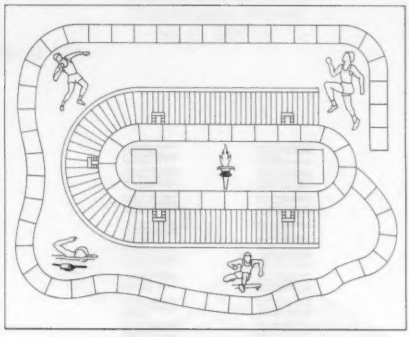


261,012
WIG STAND
Christopher J. V. White, Moreton-in-Marsh, England, assignor to Impulse Merchandising Limited, Moreton-in-Marsh, England
Filed Jan. 30, 1979, Ser. No. 7,674
Claims priority, application United Kingdom, Aug. 23, 1978, 986046/78
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D20—10

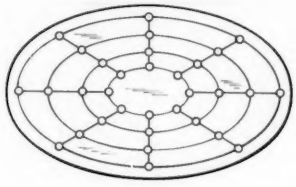
261,013
WALL OR PARTITION HUNG NAME PLATE/COAT HOOK
Donald A. DeMars, Canoga Park, Calif., assignor to Leroy M. Lefkowitz, Van Nuys, Calif., a part interest
Filed Nov. 30, 1978, Ser. No. 965,444
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—42



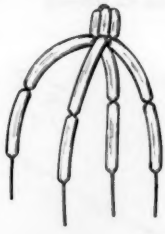
261,014
GAME BOARD
Joseph G. St. Jean, 146 Summer St., Haverhill, Mass. 01830
Filed Jul. 13, 1979, Ser. No. 57,367
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—27



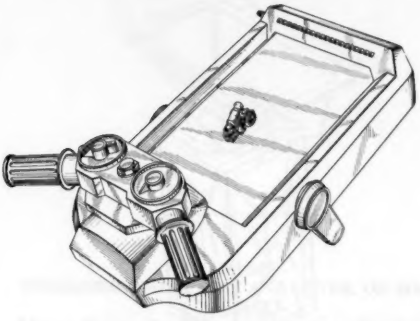
261,015
GAME BOARD
Nicholas Siedun, P.O. Box 578, Clifton, N.J. 07012
Filed Aug. 11, 1978, Ser. No. 933,250
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—35



261,016
INFLATABLE BALLOON MERRY-GO-ROUND TOY
Eugene E. Curtis, 708 S. Byrne Rd., Toledo, Ohio 43609
Filed Dec. 8, 1978, Ser. No. 967,614
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—84

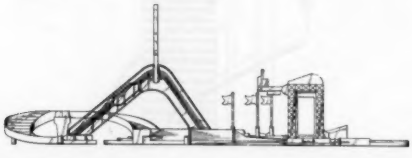


261,017
COMBINED TOY VEHICLE AND STEERING DEVICE THEREFOR
John Birdsall, Los Angeles, Calif.; Edward B. Bretschger, Cos Cob, Conn.; Fred Adickes, El Segundo, and Ronald Hellenthal, Torrance, both of Calif., assignors to Louis Marx & Co., Inc., Stamford, Conn.
Filed Feb. 10, 1978, Ser. No. 876,798
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—142



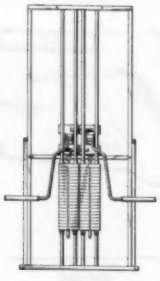
261,018
FLEXIBLE TOY TRACK
Antonie Vandenbrink, Westmaas, Netherlands, assignor to Aurora Products Canada Ltd., Rexdale, Canada
Filed Jan. 19, 1979, Ser. No. 4,956
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—143

261,019
TOY TRACKWAY
Toru Hirano, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Mar. 20, 1979, Ser. No. 22,172
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—143



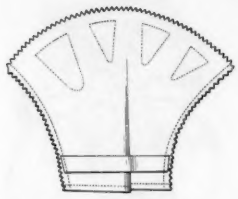
261,020
ROLLING TOY
David J. Ciganko, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 10, 1979, Ser. No. 101,804
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

261,021
PHYSICAL EXERCISER
Lloyd J. Lambert, Sr., 1538 College Ave., South Houston, Tex. 77587
Continuation-in-part of Ser. No. 815,363, Jul. 13, 1977, abandoned. This application Mar. 30, 1979, Ser. No. 25,548
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—196

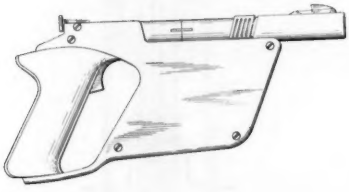


261,022
SEAT FOR SKATEBOARD
William F. Hoskins, 3165 Stonebridge, Apt. #6, Portage, Mich. 49081
Filed Nov. 20, 1978, Ser. No. 962,294
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—227

261,023
SWIMMING GLOVE
Walter Pesarek, 595 Summer St., West Lynn, Mass. 01901
Filed Apr. 24, 1978, Ser. No. 899,024
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—239

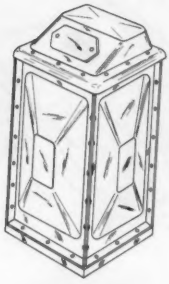


261,024
TARGET PISTOL OR SIMILAR ARTICLE
Paul A. LaViolette, 140 Hartley St., North Haven, Conn. 06473
Filed Jan. 24, 1980, Ser. No. 114,847
Term of patent 7 years
Int. Cl. D22—*01*
U.S. Cl. D22—1



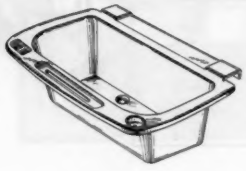
261,025
MOUSE TRAP
Donald C. Lindley, Long Beach, Calif., assignor to Farnam Companies, Inc., Phoenix, Ariz.
Filed Nov. 30, 1979, Ser. No. 98,737
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18

261,026
STORAGE TANK FOR LIQUIDS OR THE LIKE
Keisaku Koga, Ibaraki, and Takeshi Iseda, Yahata, both of Japan, assignors to Sekisui Koji Kabushiki Kaisha, Japan
Filed Oct. 13, 1978, Ser. No. 951,282
Claims priority, application Japan, Apr. 24, 1978, 53-16615
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2



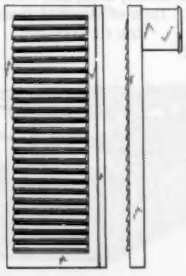
261,027
SPOUT FOR A SHOWER HEAD OR THE LIKE
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed Aug. 27, 1979, Ser. No. 70,172
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, MR 6936
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32

261,028
CHILD'S WASH BASIN
Tivadar Bitvai, Vallhamnsgatan 110, S-421 66 Vastra Frolunda, Sweden
Filed Apr. 4, 1979, Ser. No. 27,746
Claims priority, application Sweden, Oct. 4, 1978, 782284
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



261,029
COMBINED TOILET SEAT AND COVER, OR SIMILAR ARTICLE
Mogens Boyter, Ega, Denmark, assignor to Dansk Pressalit A/S, Arhus, Denmark
Continuation-in-part of Ser. No. 904,715, May 10, 1978. This application Jun. 1, 1979, Ser. No. 44,815
Claims priority, application Denmark, Nov. 11, 1977, 873/77
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

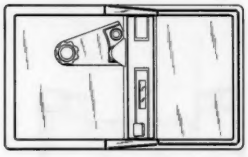
261,030
SOLAR PANEL
Harold King, 3925 Tiverton Rd., Randallstown, Md. 21133
Filed May 29, 1980, Ser. No. 154,430
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—72

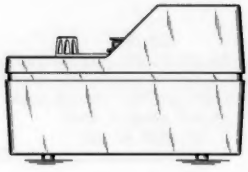


261,031
VENT BAFFLE
Bruce K. Ward, St. Louis Park, Minn., assignor to Insulation Sales, Co.
Continuation-in-part of Ser. No. 749,834, Dec. 13, 1976, Pat. No. Des. 249,704. This application Apr. 7, 1978, Ser. No. 894,395
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163

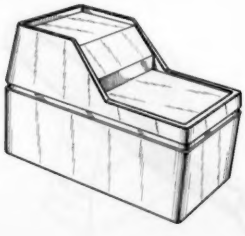
261,032
DENTAL HANDPIECE
N. Dominic Marucci, Philadelphia, and Arthur A. Knopp, Chalfont, both of Pa., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Feb. 28, 1979, Ser. No. 16,055
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12

261,033
BILIRUBIN CONCENTRATION ANALYZER
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 5, 1979, Ser. No. 9,318
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

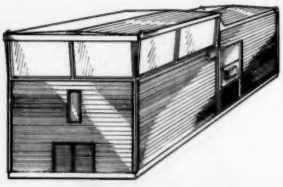




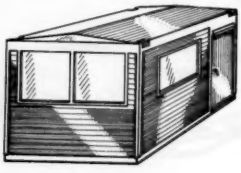
261,034
MEDICAL INSTRUMENT HOUSING
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 5, 1979, Ser. No. 9,333
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



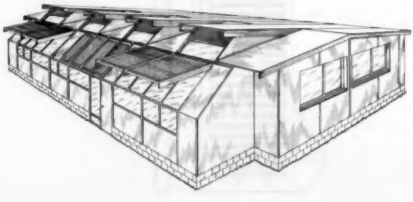
261,035
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed Dec. 12, 1979, Ser. No. 102,989
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



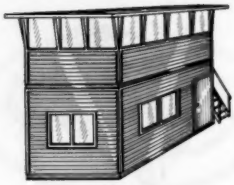
261,036
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed Dec. 12, 1979, Ser. No. 102,990
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



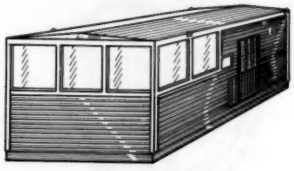
261,037
MODULAR PASSIVE SOLAR HOME
Thomas P. Schlageter, P.O. Box 12, and Charles D. Schleiger, P.O. Box 1, both of, Pulga, Calif. 95965
Filed Jan. 7, 1980, Ser. No. 110,339
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



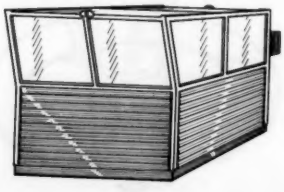
261,038
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed May 2, 1980, Ser. No. 145,996
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



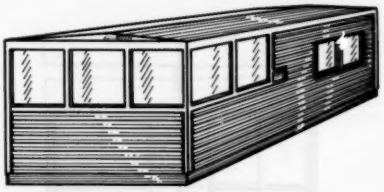
261,039
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed May 2, 1980, Ser. No. 145,997
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



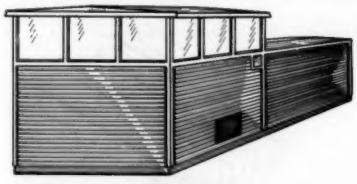
261,040
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed May 2, 1980, Ser. No. 145,998
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



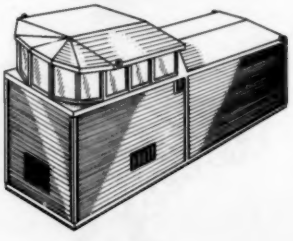
261,041
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed May 2, 1980, Ser. No. 145,999
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



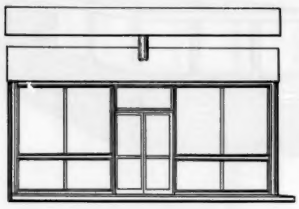
261,042
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed May 2, 1980, Ser. No. 146,000
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



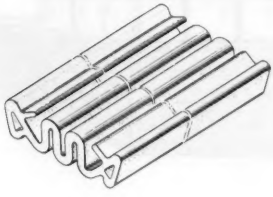
261,043
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed Dec. 12, 1979, Ser. No. 102,991
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—32



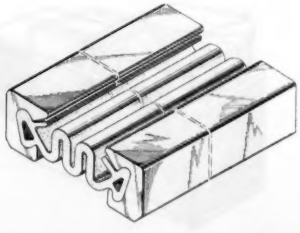
261,044
COMBINED SERVICE STATION BUILDING AND CANOPY
Charles M. Baffo, Wilton, Conn., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Mar. 30, 1979, Ser. No. 25,317
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—33



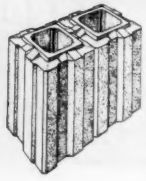
261,045
EXPANSION JOINT SEALING STRIP FOR ROADWAY JOINTS AND THE LIKE
William E. Bowman, Englewood, Colo., assignor to Bowman Construction Supply, Inc., Denver, Colo.
Filed Nov. 16, 1979, Ser. No. 95,141
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,046
EXPANSION JOINT SEALING STRIP ASSEMBLY FOR ROADWAYS AND THE LIKE
William E. Bowman, Englewood, Colo., assignor to Bowman Construction Supply, Inc., Denver, Colo.
Filed Nov. 16, 1979, Ser. No. 95,143
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

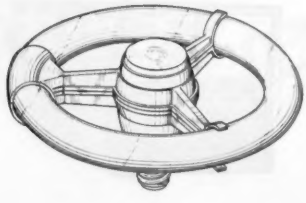


261,047
MODULAR BUILDING UNIT
Leonard L. Long, The Darlington, Suite Seven,, 2025 Peachtree Rd., NE. Atlanta, Ga. 30309
Filed Jan. 2, 1979, Ser. No. 654
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—91

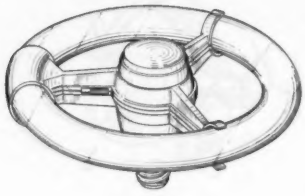


261,048
BEACON LAMP
Clifford D. Price, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Jul. 18, 1978, Ser. No. 925,840
Claims priority, application United Kingdom, Jan. 18, 1978, 983003/78
Term of patent 14 years
Int. Cl. D26—*03, 06*
U.S. Cl. D26—24

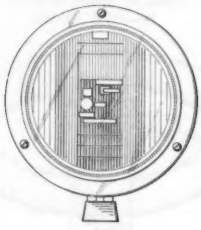
261,049
FLUORESCENT LAMP UNIT
Joseph P. Wotowiec, Cuyahoga Falls, Ohio, and Thurman Bowls, New Smyrna Beach, Fla., assignors to General Electric Company, Schenectady, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,775
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—26



261,050
FLUORESCENT LAMP UNIT
Joseph P. Wotowiec, Cuyahoga Falls, Ohio, and Thurman Bowls, New Smyrna Beach, Fla., assignors to General Electric Company, Schenectady, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,776
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—26



261,051
HEADLIGHT
Pierre Catte, Sevres, France, assignor to Cibie Projecteurs, Bobigny, France
Filed Jul. 12, 1979, Ser. No. 57,143
Claims priority, application France, Jun. 1, 1979, 79 42153
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—29



261,052
POCKET TORCH
Walter Henkels, 5142 Hückelhoven, Holunderweg 1, Fed. Rep. of Germany
Filed Apr. 20, 1978, Ser. No. 898,312
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 108
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—46

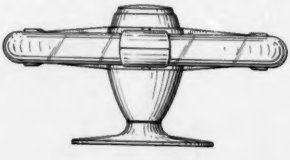
261,053
CANDLESTICK LAMP STAND
Robert J. Zellner, 2201 Chestnut Ave., Wilmette, Ill. 60091
Filed Mar. 12, 1979, Ser. No. 19,861
Term of patent 14 years
Int. Cl. D26—*05, 01*
U.S. Cl. D26—66

261,054
STAND FOR FLOOR LAMP
Robert J. Zellner, 2201 Chestnut Ave., Wilmette, Ill. 60091
Filed Mar. 12, 1979, Ser. No. 19,862
Term of patent 14 years
Int. Cl. D26—*05, 01*
U.S. Cl. D26—66

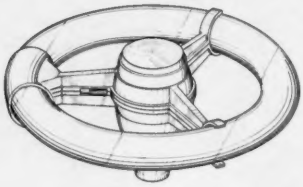
261,055
LAMP STAND
Robert J. Zellner, 2201 Chestnut Ave., Wilmette, Ill. 60091
Filed Mar. 12, 1979, Ser. No. 19,863
Term of patent 14 years
Int. Cl. D26—*05, 01*
U.S. Cl. D26—66

261,056
LIGHT FIXTURE HOUSING
Lars Andersson, Halmstad, Sweden, assignor to HAFA Fabriks AB, Halmstad, Sweden
Filed Nov. 29, 1978, Ser. No. 964,589
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—85

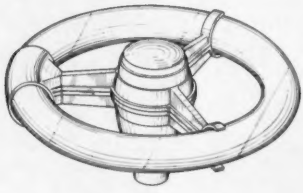
261,057
FLUORESCENT LAMP UNIT
Joseph P. Wotowiec, Cuyahoga Falls, Ohio, and Thurman Bowls, New Smyrna Beach, Fla., assignors to General Electric Company, Schenectady, N.N.Y.
Filed Jan. 8, 1979, Ser. No. 1,771
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—93



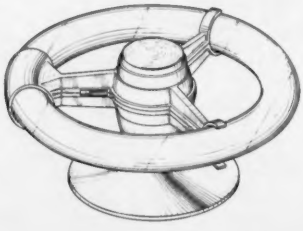
261,058
FLUORESCENT LAMP UNIT
Joseph P. Wotowiec, Cuyahoga Falls, Ohio, and Thurman Bowls, New Smyrna Beach, Fla., assignors to General Electric Company, Schenectady, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,774
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D26—93



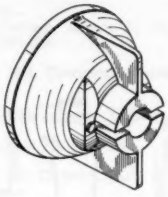
261,059
FLUORESCENT LAMP UNIT
Joseph P. Wotowiec, Cuyahoga Falls, Ohio, and Thurman Bowls, New Smyrna Beach, Fla., assignors to General Electric Company, Schenectady, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,777
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—93



261,060
FLUORESCENT LAMP UNIT
Joseph P. Wotowiec, Cuyahoga Falls, Ohio, and Thurman Bowls, New Smyrna Beach, Fla., assignors to General Electric Company, Schenectady, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,780
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—93



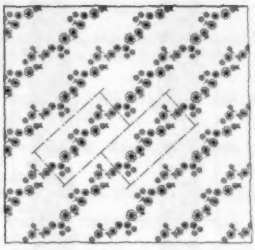
261,061
PROJECTION LAMP REFLECTOR
Emmett H. Wiley, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 12, 1979, Ser. No. 11,474
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—134



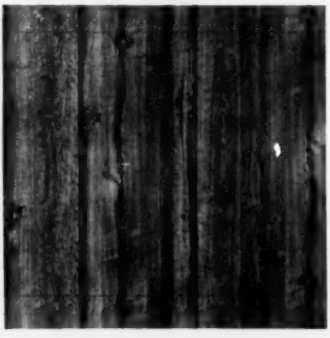
261,062
LIGHTER OR THE LIKE
Kaname Ichikawa, Tokyo, Japan, assignor to Modern Royal Co., Ltd., Tokyo, Japan
Filed Nov. 17, 1978, Ser. No. 961,487
Claims priority, application Japan, May 26, 1978, 53-21245
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

261,063
RAZOR HOLDER
Karl M. Keck, 2155 Silver Palm West, Boca Raton, Fla. 33432
Filed Sep. 24, 1979, Ser. No. 78,291
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—44

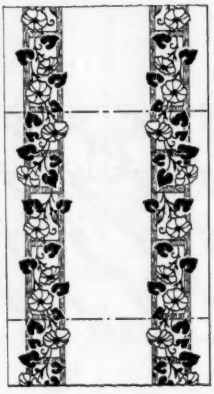
261,064
CONTINUOUS SHEET PAPER OR SIMILAR ARTICLE
Sylvia M. Kauffman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Nov. 8, 1979, Ser. No. 92,774
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B



261,065
LAMINATE SHEET
Harry R. Ford, Parkdale, Ohio, and Yasuo Yoshihashi, Tokyo, Japan, assignors to Formica Corporation, Cincinnati, Ohio
Filed Jul. 11, 1978, Ser. No. 923,616
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 R

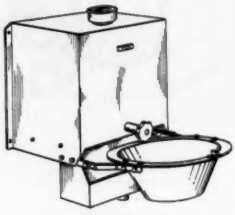


261,066
NONWOVEN SHEET MATERIAL
Diane M. McElwain, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 1, 1979, Ser. No. 80,915
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 E



261,067
NONWOVEN SHEET MATERIAL
Diane M. McElwain, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 1, 1979, Ser. No. 80,916
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 C

261,068
ABLUTION UNIT
Bruce Lotherington, Solihull, England, assignor to Teal Patents Limited, Birmingham, England
Filed Jun. 28, 1979, Ser. No. 53,939
Term of patent 14 years
Int. Cl. D99—*00/00*
U.S. Cl. D99—25



261,069
MULTI-LEVEL BAKERY TRAY
Emil L. Munch, Cincinnati, and Stuart A. Clipson, Glendale, both of Ohio, assignors to Nestier Corporation, Cincinnati, Ohio
Filed Dec. 15, 1978, Ser. No. 969,697
Term of patent 14 years
Int. Cl. D99—*99*
U.S. Cl. D99—44

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF SEPTEMBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Blanchette, Robert G.; and Curtin, Denis J., 4,292,385, Cl. 430-58.000.

A. J. Antunes & Co.: *See*—
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 4,291,617, Cl. 99-483.000.

A/S Dantherm: *See*—
Sminge, Poul E.; and Thoegersen, Svend I., 4,291,542, Cl. 62-156.000.

A.S.M., Inc.: *See*—
Corder, E. E., 4,291,462, Cl. 30-221.000.

Ab Asea Atom: *See*—
Eriksson, Olle, 4,292,134, Cl. 176-38.000.

AB Nordplat: *See*—
Barty, Bernd, 4,291,632, Cl. 108-51.100.

Abbott Laboratories: *See*—
Dren, Anthony T.; and Bopp, Barbara A., 4,292,316, Cl. 424-248.560.

Abe, Keizo: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Keizo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,291,644, Cl. 118-704.000.

Abe, Koichi, to Northern Telecom Limited. Manufacture of an optical fiber preform with micro-wave plasma activated deposition in a tube. 4,292,063, Cl. 65-3.120.

Abe, Tetuaki: *See*—
Satou, Takehide; Yoshida, Kasumi; Sagusa, Hisayuki; Ohno, Osamu; and Abe, Tetuaki, 4,291,986, Cl. 356-410.000.

ACCO Industries Inc.: *See*—
Haynes, Charles E., 4,292,267, Cl. 264-157.000.

Acey, Eugene A.: *See*—
Heiser, Warren R.; and Acey, Eugene A., 4,291,618, Cl. 100-35.000.

ACF Industries, Incorporated: *See*—
Alvarez, Patricio D.; Fowler, James M.; and Moran, George A., 4,291,862, Cl. 257-167.000.

Adam, Jean-Marie: *See*—
Galafassi, Pierre; Adam, Jean-Marie; Loew, Peter; and Scheidegger, Hans, 4,292,037, Cl. 8-554.000.

Adam, Vladimir: *See*—
Suarez, Ricardo; Chang, Oscar; and Adam, Vladimir, 4,292,548, Cl. 307-465.000.

Adams, George W.: *See*—
Smock, Steven W.; and Adams, George W., 4,292,482, Cl. 200-38.00R.

Adams, Lowell J., to B.F. Goodrich Company, The. Helicopter deicer control system. 4,292,502, Cl. 219-483.000.

Adams, William J.; and Haskins, Steve W., to Northern Telecom, Inc. Telephone set base for both wall and desk mounting. 4,292,477, Cl. 179-100.00C.

Adin, Anthony, to Eastman Kodak Company. Cobalt (III) complex imaging compositions having improved photographic properties. 4,292,399, Cl. 430-338.000.

Advanced Micro Devices, Inc.: *See*—
Schoeff, John A., 4,292,625, Cl. 340-347.0DA.

Aerojet-General Corporation: *See*—
Qasim, Javed; Walker, Samuel C.; and Longwell, Paul A., 4,291,859, Cl. 251-123.000.

Aftalion, Sebastian, to British Steel Corporation. Method and apparatus for pouring molten metal. 4,291,743, Cl. 164-66.100.

AGA Aktiebolag: *See*—
Selander, Lennart; Fahlen, Lars; and Sipek, Ladislav, 4,292,493, Cl. 219-74.000.

Agence Nationale de Valorisation de la Recherche: *See*—
Comte, Paul Y.; and Repetti, Rene J., 4,291,674, Cl. 126-419.000.

AGFA-GEVAERT N.V.: *See*—
Buelens, Edward, 4,291,802, Cl. 206-409.000.
Pollet, Robert J.; Sels, Francis J.; Brems, Karel A.; and de Ramaix, Maurice A., 4,292,400, Cl. 430-383.000.
Pollet, Robert J.; Kokelenberg, Hendrik E.; Samijn, Rafael P.; Sels, Francis J.; Ville, Frans J.; and de Jaeger, Nikolaas C., 4,292,402, Cl. 430-631.000.

Ahn, Byung K.: *See*—
Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,292,159, Cl. 204-237.000.

Ahne, Hellmut: *See*—
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, 4,292,398, Cl. 430-306.000.

Ainger, George E.; and Caverly, Brian L., to Lever Brothers Company. Process for producing confectioners' butter. 4,292,338, Cl. 426-603.000.

Air Industrie: *See*—
Remillieux, Jean, 4,292,053, Cl. 55-96.000.

Airco, Inc.: *See*—
Hay, Wayne W., 4,291,689, Cl. 128-200.240.

Aisin Seiki Kabushiki Kaisha: *See*—
Goto, Hiromi; and Ojima, Kenji, 4,291,791, Cl. 192-67.00R.

Aisin Sieki Kabushiki Kaisha: *See*—
Sakakibara, Naoji; and Hashimoto, Nobuyuki, 4,292,060, Cl. 55-385.00R.

Aisin-Warner Kabushiki Kaisha: *See*—
Sakakibara, Shiro, 4,291,596, Cl. 74-867.000.

Akada, Masanori: *See*—
Takeuchi, Satoshi; Akada, Masanori; Fujii, Hitoshi; Toida, Takashi; Takamizawa, Minoru; and Inoue, Yoshio, 4,292,397, Cl. 430-303.000.

Akao, Takeshi: *See*—
Nishizawa, Yoshihiko; Aketa, Yoshihiro; and Akao, Takeshi, 4,292,334, Cl. 426-447.000.

Akashi, Shigeharu: *See*—
Kawasaki, Hiroaki; and Akashi, Shigeharu, 4,292,140, Cl. 203-22.000.

Akazawa, Michitada: *See*—
Kondo, Shiro; and Akazawa, Michitada, 4,292,485, Cl. 200-332.000.

Aketa, Yoshihiro: *See*—
Nishizawa, Yoshihiko; Aketa, Yoshihiro; and Akao, Takeshi, 4,292,334, Cl. 426-447.000.

Akiyama, Masami: *See*—
Kojima, Hiroshi; Ito, Kunio; Akiyama, Masami; and Tanaka, Takeshi, 4,292,389, Cl. 430-169.000.

Aktiebolaget Bofors: *See*—
Bergqvist, Erik, 4,292,602, Cl. 331-94.50C.

Aktiebolaget Draco: *See*—
Jonsson, Karl E.; and Moren, Nils F. E., 4,292,324, Cl. 424-289.000.

Akzona Incorporated: *See*—
Duermeyer, Willem, 4,292,403, Cl. 435-5.000.
Kakaris, Aristotelis, 4,291,933, Cl. 339-89.00R.
Overbeek, Gerhard A., 4,292,251, Cl. 260-397.300.

Albares, Donald J., to United States of America, Navy. Optical amplification for the fiber interferometer gyro. 4,291,984, Cl. 356-350.000.

Albrecht, Cornelius B. J. d.; and Mulleneers, Jan J. M., to U.S. Philips Corporation. Examining device for determining local absorption values in a slice of a body. 4,292,524, Cl. 250-445.00T.

Alcan Aluminiumwerk Nurnberg GmbH: *See*—
Molle, Egon; and Rosch, Fritz, 4,291,614, Cl. 92-187.000.

Alcan Aluminum Corporation: *See*—
Bell, Harry E., 4,292,087, Cl. 106-193.00M.

Alco Foodservice Equipment Company: *See*—
Rodth, Joseph J., 4,291,546, Cl. 62-398.000.

Aldag, Henry R.; Marling, John B.; and Pike, Charles T., to Jersey Nuclear-Avco Isotopes, Inc. Flashlamp excited fluid laser amplifier. 4,292,601, Cl. 331-94.50L.

Algona Food Engineering Company: *See*—
Harmes, O. Burton; and McGregor, Duane F., 4,291,812, Cl. 211-207.000.

Ali, Fadia E.; Krell, Robert D.; and Snader, Kenneth M., to SmithKline Corporation. Antiallergic imidodisulfamides. 4,292,305, Cl. 424-45.000.

Allard, Joseph R., to Entwistle Company, The. Cable strand tension controlling apparatus. 4,291,527, Cl. 57-58.840.

Allegheny Ludlum Steel Corporation: *See*—
Santoli, Pat A.; and Baybrook, Howard E., 4,291,558, Cl. 72-38.000.

Allen, David O.; and Wombold, Harry A. E., to Buckeye Molding Company. Containers and closures. 4,291,813, Cl. 215-252.000.

Allen, Herbert, to Hallen Company. Cork extractor. 4,291,597, Cl. 81-3.480.

Allen, Malcolm H., Jr.: *See*—
Buzzell, Colby E.; and Allen, Malcolm H., Jr., 4,291,582, Cl. 73-861.350.

Allen R. Shuffleboard Company: *See*—
Caunter, Earl G., 4,291,880, Cl. 273-129.00L.

Allied Chemical Corporation: *See*—
Frissora, Anthony P., 4,291,575, Cl. 73-302.000.

Allis-Chalmers Corporation: *See*—
Roloff, Carl A., 4,291,808, Cl. 209-668.000.
Siazas, John J., 4,291,778, Cl. 180-271.000.
Totten, David S.; and Worringer, Thomas J., 4,291,857, Cl. 248-559.000.

Alloway Manufacturing Inc.: *See*—
Gates, Donald C., 4,291,524, Cl. 56-121.430.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L.; and Damiano, Victor V., 4,292,208, Cl. 252-470.000.

Alluto, Luigi, to Indesit Industria Elettrodomestici Italiana S.p.A. Temperature regulator for household appliances. 4,291,543, Cl. 62-158.000.

Alois Kober KG: *See*—
Wohrle, Rudolf; and Kohler, Robert, 4,291,895, Cl. 280-723.000.

Alps Electric Co., Ltd.: *See*—
Kondo, Shiro; and Akazawa, Michitada, 4,292,485, Cl. 200-332.000.

Alstetter, Franz: *See*—
Stahl, Werner; Breuer, Uwe; Richter, Bernhard; Alstetter, Franz; Krappmann, Franz; and Schuster, Hans, 4,292,177, Cl. 210-325.000.

Altmann, Josef: *See*—
Roth, Zdenek; and Altmann, Josef, 4,292,259, Cl. 261-123.000.

Aluminum Company of America: *See*—
Hoy, Malcolm G.; and Reichelt, Walter R., 4,292,496, Cl. 219-126.000.

Alvarez, Patricio D.; Fowler, James M.; and Moran, George A., to ACF Industries, Incorporated. Expanding gate valve. 4,291,862, Cl. 257-167.000.

Alvarez-Sabater, Fernando. Gravity-feed rotary tray slide projector. 4,291,955, Cl. 353-111.000.

Ambler, Jeffrey, to Gelman Sciences, Inc. Buffer composition and method for the electrophoretic separation of proteins. 4,292,154, Cl. 204-180.00G.

Ambler, Jeffrey, to Gelman Sciences, Inc. Buffer composition and method for the electrophoretic separation of proteins. 4,292,162, Cl. 204-299.00R.

Ambrosius, Bernd. Safeguard or lock device. 4,292,541, Cl. 307-10.0AT.

AMCA International Corporation: *See*—
Sigman, Earl H., 4,291,746, Cl. 164-407.000.

Amco Standards International: *See*—
Patterson, James A., 4,291,980, Cl. 356-243.000.

Amdahl Corporation: *See*—
Lee, James C. K., 4,292,647, Cl. 357-81.000.

American Can Company: *See*—
Buob, James F.; and Pauls, Walter L., 4,292,271, Cl. 264-518.000.

American Color & Chemical Corporation: *See*—
Michalowicz, William A., 4,292,248, Cl. 260-383.000.

American Cyanamid Company: *See*—
Barnes, Robert E., Jr.; and Pai, Venkatrao, 4,292,206, Cl. 252-463.000.
Bezwada, Rao S., 4,292,111, Cl. 156-307.700.

American Filtrona Corporation: *See*—
Berger, Richard M., 4,291,711, Cl. 131-336.000.

American Greetings Corporation: *See*—
Flinn, Robert W., 4,291,458, Cl. 29-650.000.

American Home Products Corporation: *See*—
Kraft, Thomas L.; Vick, Howard A.; and Meador, James W., 4,291,983, Cl. 356-338.000.

American Optical Corporation: *See*—
Prunier, Louis, 4,291,508, Cl. 51-395.000.

AMP Incorporated: *See*—
Dinger, Leon J., 4,292,099, Cl. 156-49.000.

Ampex Corporation: *See*—
Kowal, Leonard, 4,292,648, Cl. 358-8.000.

An, Byung H., to Interstate Electronics Corp. Audio signal recognition computer. 4,292,470, Cl. 179-1.50D.

Anaconda Company, The: *See*—
Bench, Stephen M., 4,292,599, Cl. 330-290.000.

Anatole J. Sipin Company: *See*—
Sipin, Anatole J.; and Carleton, Herbert R., 4,292,574, Cl. 318-331.000.

Andersen, Geert, to August Storck KG. Sugar-free confectionery material based on xylitol and sorbitol. 4,292,337, Cl. 426-573.000.

Andersen, James H. Combined toggle switch and front access fuse holder. 4,292,616, Cl. 337-4.000.

Anderson, Eric G., to Bendix Corporation, The. Stalled turbine flow meter. 4,291,584, Cl. 73-861.720.

Anderson, Marvin H.: *See*—
Kneip, George D., Jr.; and Anderson, Marvin H., 4,291,541, Cl. 62-45.000.

Ando, Yoshio: *See*—
Yanagawa, Hitoshi; Konishi, Motofumi; Ando, Yoshio; and Kashiwagi, Kazuo, 4,291,843, Cl. 242-57.000.

Anezaki, Syoji: *See*—
Marukawa, Katsukiyo; Anezaki, Syoji; and Masuda, Seiichi, 4,292,073, Cl. 75-60.000.

Anfilov, Igor V.; Ershov, Geny S.; Kaidoshko, Eduard A.; Remizov, Jury B.; Rozhenko, Anatoly L.; Suvorov, Gennady P.; and Scherbatenko, Boris G. Electrographic photocomposing machine. 4,291,971, Cl. 355-14.00R.

Angelis, Jason. Beehive. 4,291,424, Cl. 6-4.00R.

Ankarswed, Sven J., to Ankarswedshus AB Vasteras. Wall construction unit for buildings. 4,291,513, Cl. 52-284.000.

Ankarswedshus AB Vasteras: *See*—
Ankarswed, Sven J., 4,291,513, Cl. 52-284.000.

Antos, George J., to UOP Inc. Nonacidic superactive multimetallic catalytic composite for use in hydrocarbon dehydrogenation. 4,292,207, Cl. 252-466.0PT.

Antunes, August J.: *See*—
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 4,291,617, Cl. 99-483.000.

Antunes, Jerome: *See*—
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 4,291,617, Cl. 99-483.000.

Anzani, Onorio. Process for the manufacture of moulded insoles. 4,291,428, Cl. 12-146.00B.

Appels, Johannes A.; Collet, Marnix G.; Hart, Paul A. H.; and Verhoeven, Johannes F. C. M., to U.S. Philips Corporation. Semiconductor device. 4,292,642, Cl. 357-13.000.

Arai, Fuminori: *See*—
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,292,272, Cl. 422-57.000.

Arai, Katsuhiko: *See*—
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; and Arai, Katsuhiko, 4,292,361, Cl. 428-215.000.
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; and Kaneda, Hiroshi, 4,292,369, Cl. 428-313.000.

Arai, Kozo: *See*—
Kotani, Teizo; Arai, Kozo; Fukui, Shiomi; and Nagata, Masaki, 4,292,261, Cl. 264-24.000.

Arasim, Stanley J., Jr.: *See*—
Heller, Martin G.; Rudder, Joel; and Arasim, Stanley J., Jr., 4,291,819, Cl. 221-298.000.

Arey, William F., Jr.: *See*—
Mayer, Francis X.; and Arey, William F., Jr., 4,292,171, Cl. 208-164.000.

Argyle, Charles S.; Bamsey, Robert C.; and Millard, Gregory S. T., to Borg-Warner Corporation. Two fluid heat exchanger. 4,291,760, Cl. 165-166.000.

Arkay Packaging Corporation: *See*—
Iversen, Niels A.; Pedersen, Jorgen; and Lolk, Hans, 4,291,904, Cl. 285-162.000.

Arkulis, Grigory E.: *See*—
Korytov, Vladimir A.; Maljushevsky, Pavel P.; Guly, Grigory A.; Shkatov, Alexandr S.; Sladkoshteev, Vladimir T.; Patanin, Ruslan V.; Dorokhov, Vasily I.; Klemeshov, Georgy A.; and Arkulis, Grigory E., 4,291,742, Cl. 164-501.000.

Arlt, Klaus-Peter: *See*—
Grigo, Ulrich; Morbitzer, Leo; Arlt, Klaus-Peter; Binsack, Rudolf; and Merten, Josef, 4,292,222, Cl. 260-29.1SB.

Armanet, Jean-Michel: *See*—
Regnault, Alain; Sachetto, Jean-Pierre; Tournier, Herve; Hamm, Thomas; and Armanet, Jean-Michel, 4,292,089, Cl. 127-1.000.

Artamonov, Viktor L.: *See*—
Medovar, Boris I.; Artamonov, Viktor L.; Kirsanov, Pavel I.; Marchenko, Alexandr M.; Bogachenko, Alexei G.; Pavlov, Leonid V.; Kamensky, Jury M.; Gutnov, Ruslanbek B.; and Platonov, Pavel M., 4,291,744, Cl. 164-509.000.

Artzer, Richard F., to Covington Brothers, Inc. Method and apparatus for manufacture of wire truss and sinuous strut therefor. 4,291,732, Cl. 140-112.000.

ASA Enterprises, Inc.: *See*—
Saunders, Albert A., 4,291,565, Cl. 72-290.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Saito, Akira; Yamori, Akio; and Ibaragi, Toshio, 4,292,414, Cl. 525-255.000.

Asai, Mitsuko: *See*—
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,292,309, Cl. 424-119.000.

Ashihara, Yoshihiro: *See*—
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Ashland Oil, Inc.: *See*—
Gabriel, Hans R. L.; Post, Larry K.; Culbertson, Billy M.; and Graham, Curtis M., 4,292,231, Cl. 260-33.4UR.

Asscher, Meir: *See*—
Daren, Stephen L. J.; Vofsi, David; and Asscher, Meir, 4,292,453, Cl. 570-193.000.

Asselman, George A. A.; and Van Mensvoort, Adrianus J., to U.S. Philips Corporation. Solar collector, comprising an evaporation/condensation system. 4,291,676, Cl. 126-433.000.

Assour, Jacques M.; Bates, Theresa I.; Bender, John R.; and Neilson, John M. S., to RCA Corporation. Semiconductor thyristor device having integral ballast means. 4,292,646, Cl. 357-38.000.

Athearn, Lee F., to Medtronic, Inc. Lithium-halogen batteries. 4,292,346, Cl. 427-115.000.

Atlantic Richfield Company: *See*—
Leonard, John J., 4,292,254, Cl. 260-453.00P.
Vartuli, James C.; and Zehner, Lee R., 4,292,201, Cl. 252-435.000.
Vartuli, James C.; and Zehner, Lee R., 4,292,202, Cl. 252-435.000.

Audi NSU Auto Union AG: *See*—
Pagel, Ernst O.; and Harth, Robert, 4,292,686, Cl. 455-194.000.

August Storck KG: *See*—
Andersen, Geert, 4,292,337, Cl. 426-573.000.

Auinger, Herbert; Bradler, Peter; Weppler, Rudolf; and Stepina, Jaroslav, to Siemens Aktiengesellschaft. Electric drive with a universal and induction motor combined on a common lamination stack. 4,292,559, Cl. 310-206.000.

Aurea, Walter C.: *See*—
Hansen, Robert N., 4,291,893, Cl. 280-507.000.

Austin, George W.: *See*—
Faitani, Joseph J.; Austin, George W.; Chase, Terry J.; Suljak, George T.; and Misage, Robert J., 4,292,274, Cl. 422-197.000.

Austin, John J., to Champion International Corporation. Carton with venting arrangement. 4,291,806, Cl. 206-620.000.

Automobiles Peugeot: *See—*
Coatantiec, Alain, 4,291,909, Cl. 294-88.000.
Avery International Corporation: *See—*
Pekko, John A., 4,292,370, Cl. 428-355.000.
Aylott, Ross I.: *See—*
Byrne, Geoffry A.; and Aylott, Ross I., 4,292,300, Cl. 424-19.000.
B.F. Goodrich Company, The: *See—*
Adams, Lowell J., 4,292,502, Cl. 219-483.000.
Bauer, Dieter W., 4,291,794, Cl. 192-107.00M.
Huddleston, George R., Jr.; Turner, James W.; and Konter, Kenneth D., 4,292,424, Cl. 528-500.000.
Lai, John T.; and Son, Pyong N., 4,292,240, Cl. 260-239.30R.
Layer, Robert W.; and Son, Pyong N., 4,292,237, Cl. 260-45.8NW.
Morris, Roger E., 4,292,195, Cl. 252-401.000.
Turner, James W.; and Mikofalvy, Bela K., 4,292,420, Cl. 526-212.000.
Bachen, Manfred: *See—*
Breiding, Hans-Joachin; and Bachen, Manfred, 4,291,569, Cl. 72-403.000.
Badia, Frank A.: *See—*
Petersen, Walter A.; Travis, Jonathan A.; and Badia, Frank A., 4,292,377, Cl. 428-675.000.
Badische Corporation: *See—*
Jahn, Alex K., 4,292,182, Cl. 252-8.600.
Badoz, Jean-Marie; and Merceron, Daniel, to Socapex; and Souriau & Compagnie. Self-stripping contact element for a connector. 4,291,935, Cl. 339-97.00R.
Baidwan, Balinderjeet S.: *See—*
Petty, Thomas L.; and Baidwan, Balinderjeet S., 4,291,704, Cl. 128-728.000.
Bailey, Escar L.: *See—*
Rodgers, Aubrey; and Bailey, Escar L., 4,291,849, Cl. 244-3.220.
Baird, William C., Jr.: *See—*
Mauldin, Charles H.; and Baird, William C., Jr., 4,292,204, Cl. 252-439.000.
Bajka, Peter, to Compool Corporation. Submersible remote control switch assembly. 4,292,542, Cl. 307-28.000.
Baker International Corporation: *See—*
Beimgraben, Herbert W.; and Reinhardt, Paul H., 4,291,723, Cl. 137-508.000.
Pampell, Davy G., 4,291,764, Cl. 166-173.000.
Balaban, Alvin R.: *See—*
Steckler, Steven A.; and Balaban, Alvin R., 4,292,654, Cl. 358-158.000.
Balda-Werke: *See—*
Korber, Hermann, 4,291,963, Cl. 354-128.000.
Baldakova, Iraida A.: *See—*
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Baldi, Alfonso L.; and Damiano, Victor V., to Alloy Surfaces Company, Inc. Diffusion coating combinations. 4,292,208, Cl. 252-470.000.
Baldwin, Bryce R.; Brady, Laurence M.; and Holcomb, Warren N., to General Motors Corporation. Thrust nut lock retainer. 4,292,000, Cl. 403-320.000.
Baldwin-Korthe Web Controls, Inc.: *See—*
Glanz, Richard, 4,291,825, Cl. 226-18.000.
Ballard, John R., to Rolls-Royce Limited. Gas turbine engine cowling. 4,291,530, Cl. 60-39.09P.
Bambara, Joseph E., to Servo Corporation of America. Quasi-doppler direction finding equipment. 4,292,639, Cl. 343-113.0DE.
Bamsey, Robert C.: *See—*
Argvle, Charles S.; Bamsey, Robert C.; and Millard, Gregory S. T., 4,291,760, Cl. 165-166.000.
Bando, Yoshihide; and Tanaka, Toshiki, to Omron Tateisi Electronics Co. Flat-shaped electromagnetic relay having multiple contacts. 4,292,613, Cl. 335-128.000.
Baratz, Uriel. Solar collector. 4,291,682, Cl. 126-448.000.
Barber, Robert M.: *See—*
Gilchrist, Ralph E.; Hover, George W.; and Barber, Robert M., 4,291,765, Cl. 166-273.000.
Bardenheuer, Friedrich: *See—*
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Barels, Ronald R.; and Ghinazzi, Daniel J. Oil based dentifrice. 4,292,304, Cl. 424-37.000.
Barnes, Lawrence K.: *See—*
Barnes, Wayne R.; and Barnes, Lawrence K., 4,292,481, Cl. 179-178.000.
Barnes, Robert E., Jr.; and Pai, Venkatrao, to American Cyanamid Company. Use of hollow glass spheres in conjunction with rehydratable alumina for making low density catalyst support beads. 4,292,206, Cl. 252-463.000.
Barnes, Wayne R.; and Barnes, Lawrence K. Decorative applique and decorative faceplate assembly for push-button telephones. 4,292,481, Cl. 179-178.000.
Barone, Joseph P.; Loynaz, Sergio A.; and Bauer, Frederick W., to Martin Marietta Corporation. Non-abrasive bauxite-based fire retardant. 4,292,188, Cl. 252-62.000.
Barr, Arthur. Cosmetic breath freshener and palate coolant composition and method of use. 4,292,028, Cl. 433-180.000.
Barr, Charles W.; Lerer, Michael I.; Sanders, Royden C., Jr.; and Vassar, Russell J., Jr., to R. C. Sanders Technology Systems, Inc. Printer pin control circuitry. 4,291,992, Cl. 400-124.000.
Barrera, Giorgio, to Officine Meccaniche Pavesi & C. S.p.A. Device for inserting pre-wound coils into stator slots. 4,291,459, Cl. 29-734.000.
Barrett, Melvin L. Material feeder. 4,292,066, Cl. 65-335.000.
Barriquand: *See—*
Barriquand, Bernard, 4,291,555, Cl. 68-13.00R.
Barriquand, Bernard, to Barriquand. Machines for the wet treatment of fabrics in rope form. 4,291,555, Cl. 68-13.00R.
Barry, Robert F., to Westinghouse Electric Corp. Monitoring of operating processes. 4,292,129, Cl. 176-24.000.
Barry Wright Corporation: *See—*
Peterson, Robert R.; and Ventura, Daniel S., 4,291,925, Cl. 308-26.000.
Bartek, Joseph P.; Cepulis, Rimoydas L.; and Grasselli, Robert K., to Standard Oil Co., The. Multi-stage dehydrogenation process for preparing indene. 4,292,455, Cl. 585-320.000.
Barth, Heinz: *See—*
Heynisch, Hinrich; Huebner, Erwin; and Barth, Heinz, 4,292,566, Cl. 315-3.500.
Barty, Bernd, to AB Nordplat. Bottom structure for containers, load-carrying platforms or the like. 4,291,632, Cl. 108-51.100.
Basalaev, Anany M.: *See—*
Frolov, Jury F.; Sukoian, Nariman A.; Proshkin, Ivan T.; and Basalaev, Anany M., 4,292,460, Cl. 13-14.000.
BASF Aktiengesellschaft: *See—*
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Lechtken, Peter; Bronstert, Bernd; Hoffmann, Gerhard; Vyvial, Rudolf; and Lynch, John, 4,292,152, Cl. 204-159.150.
Lindner, Alfred; Volkamer, Klaus; Wagner, Ulrich; Pommer, Dieter; Schneider, Klaus-Juergen; and Schwentker, Harald, 4,292,141, Cl. 203-49.000.
BASF Wyandotte Corporation: *See—*
Davis, Pauls; Maxwell, Jerrold F.; and Wilson, Joe C., 4,292,190, Cl. 252-75.000.
Patil, Arvind S.; and Netherton, Lowell E., 4,292,294, Cl. 423-594.000.
Bash, C. Malcolm; and Pasquito, Joseph, to Prince Manufacturing Co., Inc. Propulsion device for spherical objects having an oscillating support frame providing a programmed discharge of said objects. 4,291,665, Cl. 124-56.000.
Basili, Robert A.; and Wilson, William B., to Plastic Reel Corporation of America. Video cassette storage container. 4,291,801, Cl. 206-387.000.
Bass, Sidney; and Pimentel, Gary W., to Mattel, Inc. Board game apparatus and method of playing. 4,291,884, Cl. 273-249.000.
Bassani, Mariano. Apparatus for opening textile fabrics in rope form. 4,291,441, Cl. 26-75.000.
Bates, John K.: *See—*
Krumpelt, Michael; and Bates, John K., 4,292,378, Cl. 429-15.000.
Bates, Junior L.: *See—*
Marchant, David D.; and Bates, Junior L., 4,292,209, Cl. 252-521.000.
Bates, Richard L.: *See—*
D'Antonio, Nicholas F.; and Bates, Richard L., 4,291,894, Cl. 280-612.000.
Bates, Theresa I.: *See—*
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Battelle Memorial Institute: *See—*
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Regnault, Alain; Sachetto, Jean-Pierre; Tournier, Herve; Hamm, Thomas; and Armanet, Jean-Michel, 4,292,089, Cl. 127-1.000.
Battrell, Charles F., to Procter & Gamble Company, The. Fabric softening compositions. 4,292,035, Cl. 8-137.000.
Batts, Tom, to Swift & Company. Tendon pulling. 4,291,434, Cl. 17-11.300.
Baudoin, Patrice, to Regie Nationale des Usines Renault. Method of vehicle engine control. 4,291,594, Cl. 74-857.000.
Baudot, Jean-Jacques, to Societe Anonyme de Telecommunications. Optical panoramic survey. 4,291,937, Cl. 350-23.000.
Bauer, Dieter W., to B. F. Goodrich Company, The. Power transmission and energy absorbing systems. 4,291,794, Cl. 192-107.00M.
Bauer, Frederick W.: *See—*
Barone, Joseph P.; Loynaz, Sergio A.; and Bauer, Frederick W., 4,292,188, Cl. 252-62.000.
Bauer, Philippe, to Societe Industrielle de Brevets et d'Etudes. Solenoid valves, particularly for carburetors. 4,291,860, Cl. 251-129.000.
Baum, Gary A.; and Habeger, Charles C., to Institute of Paper Chemistry, The. On line ultrasonic velocity gauge. 4,291,577, Cl. 73-597.000.
Baur, Eduard. Method of manufacturing a hollow casting mold. 4,291,739, Cl. 164-5.000.
Bausch & Lomb Incorporated: *See—*
Martino, Ronald J.; and Shawcross, Alfred L., 4,292,663, Cl. 362-97.000.
Baxter Travenol Laboratories, Inc.: *See—*
Hannah, Richard E.; and Lyons, Steffen, 4,292,270, Cl. 264-320.000.
Mascoli, Carmine C.; Pope, J. Lee, Jr.; and Weber, Phillip L., 4,292,405, Cl. 435-31.000.
Newman, Ferris E., 4,291,470, Cl. 34-12.000.
Parsons, George H., Jr., 4,292,296, Cl. 424-1.000.
Baybrook, Howard E.: *See—*
Santoli, Pat A.; and Baybrook, Howard E., 4,291,558, Cl. 72-38.000.

Bayer Aktiengesellschaft: *See—*
Binsack, Rudolf; Rempel, Dieter; Humme, Gert; and Ott, Karl-Heinz, 4,292,233, Cl. 260-40.00R.
Blume, Gotz; and Muller, Hans-Otto, 4,292,210, Cl. 252-522.00R.
Grigo, Ulrich; Morbitzer, Leo; Arlt, Klaus-Peter; Binsack, Rudolf; and Merten, Josef, 4,292,222, Cl. 260-29.1SB.
Hennig, Hans J.; Ziemek, Peter; and Schellmann, Erhard, 4,292,255, Cl. 260-453.0AR.
Hentschel, Karl-Heinz; Dhein, Rolf; and Schule, Wolfgang, 4,292,187, Cl. 252-49.500.
Kruckenberg, Winfried; and Schundehutte, Karl H., 4,292,239, Cl. 260-158.000.
Kubitza, Werner; Mennicken, Gerhard; and Pedain, Josef, 4,292,350, Cl. 427-385.500.
Kuhlthau, Hans-Peter, 4,292,238, Cl. 260-158.000.
Scharf, Hans-Dieter; and Frauenrath, Herbert, 4,292,246, Cl. 260-347.400.
Schroder, Rolf; and Lurssen, Klaus, 4,292,072, Cl. 71-105.000.
Schulte, Klaus; and Ersfeld, Heinrich, 4,291,991, Cl. 366-159.000.
Wenzel, Wolfgang; and Meckel, Walter, 4,292,226, Cl. 260-29.2TN.

Bayer Antwerpen: *See—*
Denecker, Gabriel; Sluyts, Domien; Putseys, Roland; Van Herck, Willy; Claes, Ludo; and Spott, Georg, 4,292,043, Cl. 23-296.000.

Bayerische Motoren Werke Aktiengesellschaft: *See—*
Steinberg, Klaus; and Hoffmann, Gerhard, 4,291,501, Cl. 49-386.000.

Bayles, Bruce R. Solar panel. 4,291,683, Cl. 126-448.000.

BBC Brown, Boveri & Co., Ltd.: *See—*
Oplatka, George, 4,291,537, Cl. 60-652.000.
Starcevic, Mihailo, 4,292,554, Cl. 310-58.000.

Beale, Paul E., to Beatrice Foods Co. Double nozzle block. 4,292,018, Cl. 425-144.000.

Beatrice Foods Co.: *See—*
Beale, Paul E., 4,292,018, Cl. 425-144.000.
Williams, Wilmore; and Luksas, Anthony J., 4,292,330, Cl. 426-20.000.

Becchi, Giorgio: *See—*
Palazzetti, Mario; Becchi, Giorgio; and Cane, Guiseppe, 4,291,834, Cl. 237-12.100.

Becker, Carl H. Method of making laser disc memory storage article. 4,292,109, Cl. 156-281.000.

Beecham Group Limited: *See—*
Davis, Adrian F., 4,292,298, Cl. 424-10.000.

Beigel, Michael L.: *See—*
Tavel, Donald L.; and Beigel, Michael L., 4,291,605, Cl. 84-1.260.

Beimgraben, Herbert W.; and Reinhardt, Paul H., to Baker International Corporation. Fluid pressure actuated by-pass and relief valve. 4,291,723, Cl. 137-508.000.

Bekkering, Hendrik M.; and Schmidt, Ernst M., to Duphar International Research B.V. Disposable injection syringe. 4,291,695, Cl. 128-218.0NV.

Bell, Harry E., to Alcan Aluminum Corporation. Coatings pigmented with nonleafing aluminum flake. 4,292,087, Cl. 106-193.00M.

Bell & Howell Company: *See—*
Bowman, Ronald, 4,291,701, Cl. 128-675.000.

Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., to Colt Industries Operating Corp. Electrical discharge machining power supply with digitally controlled on and off time and protective system. 4,292,490, Cl. 219-69.00P.

Bell, Seymour; and Juengel, Richard O., to Valeron Corporation, The. Transducer for measuring workpieces. 4,291,466, Cl. 33-148.00H.

Bell Telephone Laboratories, Incorporated: *See—*
Boll, Harry J., 4,292,677, Cl. 365-222.000.
Cheung, Nim K., 4,292,260, Cl. 264-1.500.
Embree, Milton L.; Goldthorp, David C.; and Vogelpohl, David R., 4,292,604, Cl. 331-111.000.
Marcuse, Dietrich; and Presby, Herman M., 4,292,341, Cl. 427-10.000.
Miller, Richard C.; and Schwartz, Bertram, 4,292,512, Cl. 250-205.000.

Bemis Company, Inc.: *See—*
Wolske, Eugene H., 4,292,033, Cl. 493-221.000.

Bench, Stephen M., to Anaconda Company, The. Low pass active filter. 4,292,599, Cl. 330-290.000.

Bender, John R.: *See—*
Assour, Jacques M.; Bates, Theresa I.; Bender, John R.; and Neilson, John M. S., 4,292,646, Cl. 357-38.000.

Bender, Max: *See—*
Probyn, Keith A.; Nolen, Richard W.; Erickson, Charles W.; Dawson, Gerald G.; Goldstein, Ralph; and Bender, Max, 4,292,034, Cl. 493-92.000.

Bendix Corporation, The: *See—*
Anderson, Eric G., 4,291,584, Cl. 73-861.720.
Buike, James W., 4,291,583, Cl. 73-861.750.
Lao, Binneg Y., 4,292,659, Cl. 361-283.000.

Bendoni, Leonard V.; and Green, Lawrence E., to Polaroid Corporation. Photographic film assemblage. 4,291,966, Cl. 354-275.000.

Bengtsson, Algot E. Hand stamp having an adjustable stamp print. 4,291,622, Cl. 101-368.000.

Benkert, Donald E. Rotary crop harvester with rapidly replaceable parts. 4,291,525, Cl. 56-327.00R.

Berg, Lloyd, to International Synthetic Rubber Co., Ltd. Separation of ethylbenzene from para- and meta-xylenes by extractive distillation. 4,292,142, Cl. 203-51.000.

Berger, Dale F. Drop latch. 4,291,907, Cl. 292-188.000.

Berger, Eugene; and Derroitte, Jean-Louis, to Solvay & Cie. Catalyst composition for polymerization of olefins. 4,292,200, Cl. 252-431.00C.

Berger, Richard M., to American Filtrona Corporation. Tobacco smoke filter providing tobacco flavor enrichment, and method for producing same. 4,291,711, Cl. 131-336.000.

Bergman, Oswald: *See—*
Hay, Robert A.; and Bergman, Oswald, 4,292,019, Cl. 425-325.000.

Bergqvist, Erik, to Aktiebolaget Bofors. Laser resonator. 4,292,602, Cl. 331-94.50C.

Bergsten, Victor E.; Eardley, Edward P.; and Halvorson, Thomas G., to Union Carbide Corporation. Solid refuse disposal apparatus. 4,291,634, Cl. 110-235.000.

Bergsten, Victor E.; Eardley, Edward P.; and Fisher, Theodore F., to Union Carbide Corporation. Solid refuse disposal process. 4,291,636, Cl. 110-346.000.

Bernard, Walter J., to Sprague Electric Company. Post-treatment of etched aluminum capacitor foil. 4,292,148, Cl. 204-144.000.

Bernardo, Matthew: *See—*
Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T., 4,291,448, Cl. 29-156.80B.

Bernhard Forster GmbH: *See—*
Forster, Rolf, 4,292,025, Cl. 433-18.000.

Berringer, Robert T. Flat plate heat exchangers. 4,291,681, Cl. 126-445.000.

Bers, Abraham, to Massachusetts Institute of Technology. System and method for generating steady state confining current for a toroidal plasma fusion reactor. 4,292,125, Cl. 176-3.000.

Berthold, Gert; Dreyhaupt, Dieter; Dunse, Helmfried; Henker, Erich; and Viehweg, Bernd, to VEB Wissenschaftlich-Technisches Zentrum Automobilbau. Snow vehicle. 4,291,892, Cl. 280-28.000.

Bertotti, Elvio: *See—*
Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno, 4,292,218, Cl. 260-22.0CB.

Bevan, Thomas M.: *See—*
Yie, Gene G.; and Bevan, Thomas M., 4,291,727, Cl. 138-93.000.

Beveridge, John H.: *See—*
Linhardt, Hans D.; and Beveridge, John H., 4,292,050, Cl. 55-1.000.

Beynet, Pierre A., to Standard Oil Company (Indiana). Drilling fluid bypass for marine riser. 4,291,772, Cl. 175-5.000.

Bezwada, Rao S., to American Cyanamid Company. Method of adhesion of rubber to reinforcing materials. 4,292,111, Cl. 156-307.700.

Biasotti, Joseph B.: *See—*
Vartanian, Paul F.; and Biasotti, Joseph B., 4,292,047, Cl. 44-65.000.

Bidegain, Georgy, to Embadac S.A. Process and machine for covering a tubular member, more particularly for covering a box. 4,292,102, Cl. 156-213.000.

Bieber, Larry C.: *See—*
Wilson, John F.; Hoover, Edward D.; Hammond, Philip K.; Moshier, William A.; Woodell, Jack L.; Spaniol, John W.; Bowerman, John J.; Bieber, Larry C.; and Perlman, Marvin, 4,292,465, Cl. 178-3.000.

Bier, Larry J.: *See—*
Oldfield, William W.; and Bier, Larry J., 4,291,936, Cl. 339-177.00R.

Bik, Johannes T. J.: *See—*
Koster, Hendrikus J.; Bik, Johannes T. J.; Clardey, Johannes G.; and Smorenberg, Dirk, 4,291,712, Cl. 131-339.000.

Bilancini, Luigi: *See—*
Perazzoni, Pierluigi; and Bilancini, Luigi, 4,292,194, Cl. 252-400.00R.

Billeter, Henry R., to Sloan Valve Company. Empty and load brake device. 4,291,923, Cl. 303-23.00R.

Billig, Frederick S.: *See—*
Dugger, Gordon L.; and Billig, Frederick S., 4,291,533, Cl. 60-240.000.

Binek, Paul H.; Cherney, Thomas M.; Magnusson, John M.; and Cronk, Bryon J., to Minnesota Mining and Manufacturing Company. Connector for optical fiber cables. 4,291,943, Cl. 350-96.220.

Binsack, Rudolf; Rempel, Dieter; Humme, Gert; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. High-impact polybutylene terephthalate. 4,292,233, Cl. 260-40.00R.

Binsack, Rudolf: *See—*
Grigo, Ulrich; Morbitzer, Leo; Arlt, Klaus-Peter; Binsack, Rudolf; and Merten, Josef, 4,292,222, Cl. 260-29.1SB.

Biotherapeutics, Inc.: *See—*
Sanders, Murray J.; and Vick, James A., 4,292,308, Cl. 424-98.000.

Birdwell, James A.; and Delasko, Joseph M., to Dresser Industries, Inc. Pulsed power supply system. 4,292,592, Cl. 328-233.000.

Birk, Earl, to Litton Systems, Inc. Microwave oven door having a conformable screen. 4,292,488, Cl. 219-10.55D.

Bishop, Walter S., Jr. Combination socket wrench and gauge. 4,291,426, Cl. 7-100.000.

Bisle, Hans E., to Boehringer Ingelheim GmbH. Stable concentrated lactic acid containing mixture. 4,292,339, Cl. 426-650.000.

Black & Decker Inc.: *See—*
Cuneo, Giuseppe, 4,292,571, Cl. 318-17.000.

Blackburn, Martin J.; and Smith, Michael P., to United Technologies Corporation. Titanium alloys of the Ti_3Al type. 4,292,077, Cl. 75-175.500.

Blanchette, Claude. Convertible sled. 4,291,891, Cl. 280-9.000.

Blanchette, Robert G.; and Curtin, Denis J., to A. B. Dick Company. Bi-modal photoreceptor and method. 4,292,385, Cl. 430-58.000.

Blevex Limited: *See—*
Fryer, Kevin C.; and Prentice, Edgar C., 4,292,358, Cl. 428-135.000.

Blickley, Michael; and Naccara, Nicholas G., to Midland-Ross Corporation. Shaftless rewind chuck. 4,291,844, Cl. 242-68.200.

Bloom, Terry R., to CTS Corporation. Exhaust system and method for venting a tunnel kiln. 4,291,471, Cl. 34-12.000.

Bloomer, Ivan, to Carrier Drysys Limited. Endless paint separating member for paint spray booths. 4,292,056, Cl. 55-243.000.

Blount, David H. Process for the production of polyurethane products. 4,292,214, Cl. 260-9.000.

Blount, David H. Process for the production of epoxy cellular solid products. 4,292,413, Cl. 521-136.000.

Blume, Gotz; and Muller, Hans-Otto, to Bayer Aktiengesellschaft. 1-Phenyl- and -benzyl-2,2-dichloro-cyclopropanes as scents. 4,292,210, Cl. 252-522.00R.

Bock, Gerd; Zettl, Herbert; Zappen, Hans-Wilhelm; and Zimmermann, Friedrich, to Robert Bosch GmbH. Method and circuit for reading-out data from a television pickup (image sensor). 4,292,653, Cl. 358-140.000.

Boder, Wilfried, to PPT Pyrolyse-und Prozessanlagentechnik GmbH & Co. Process and apparatus for ducting flue gas within a boiler. 4,291,649, Cl. 122-136.00R.

Boehringer Ingelheim GmbH: *See*—
Bisle, Hans E., 4,292,339, Cl. 426-650.000.
Tauber, Oswald; Engelhardt, Gunther; Leitold, Matyas; and Schmidt, Gunther, 4,292,319, Cl. 424-250.000.

Boehringer Mannheim GmbH: *See*—
Kaiser, Fritz; Koch, Klaus; Schaumann, Wolfgang; and Voigtlander, Wolfgang, 4,292,314, Cl. 424-182.000.

Boeing Company, The: *See*—
Johnson, William R., 4,291,851, Cl. 244-119.000.
Klees, Garry W., 4,291,782, Cl. 181-215.000.
Matysak, Edward A., 4,291,785, Cl. 184-55.00A.
Schrock, Jesse C. E., 4,291,905, Cl. 285-192.000.
Sigalla, Armand, 4,291,853, Cl. 244-87.000.
Simmons, Gerald C., 4,291,852, Cl. 244-147.000.

Bogachenko, Alexei G.: *See*—
Medovar, Boris I.; Artamonov, Viktor L.; Kirsanov, Pavel I.; Marchenko, Alexandr M.; Bogachenko, Alexei G.; Pavlov, Leonid V.; Kamensky, Jury M.; Gutnov, Ruslanbek B.; and Platonov, Pavel M., 4,291,744, Cl. 164-509.000.

Bogdan, Wesley: *See*—
Hansen, Robert N., 4,291,893, Cl. 280-507.000.

Bogenschutz, Thomas M.; and Bohusch, Glen O., to General Signal Corporation. Hydraulic slack adjusting apparatus. 4,291,789, Cl. 188-351.000.

Bohusch, Glen O.: *See*—
Bogenschutz, Thomas M.; and Bohusch, Glen O., 4,291,789, Cl. 188-351.000.

Boileau, Sylvie L.; Caubere, Paul J.; Raynal, Serge F.; Lecolier, Serge L.; and N'Debeka, Gilberte N., to Societe Nationale des Poudres et Explosifs. Anionic polymerization initiators based on alkali metal amides in combination with alkali metal salts and anionic polymerization process using these initiators. 4,292,421, Cl. 526-220.000.

Boksjo, Lennart. Pier construction. 4,292,005, Cl. 405-219.000.

Bolen, Charles E.: *See*—
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,292,371, Cl. 428-378.000.

Boll, Harry J., to Bell Telephone Laboratories, Incorporated. Self-refreshed capacitor memory cell. 4,292,677, Cl. 365-222.000.

Bollinger, Joseph M., to Rohm and Haas Company. Polymeric additive for lubricants and fuels. 4,292,185, Cl. 252-47.500.

Bombardier-Rotax Gesellschaft m.b.H.: *See*—
Obermayer, Alfred, 4,291,654, Cl. 123-185.0BA.

Bonacci, John C.; and Patterson, John R., to Mobil Oil Corporation. Noble metal reforming of naphtha. 4,292,167, Cl. 208-66.000.

Bondarenko, Alexandr D.: *See*—
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A., 4,292,494, Cl. 219-76.130.

Boninchi, S.A.: *See*—
Wenger, Karl, 4,292,682, Cl. 368-289.000.

Bonis, Laszlo J., to Composite Container Corporation. Moisture-impervious coextruded container. 4,292,355, Cl. 428-35.000.

Bonner, Stephen D., to Schlumberger Technology Corporation. Eddy current method and apparatus for inspecting ferromagnetic tubular members. 4,292,589, Cl. 324-221.000.

Bonney, Christopher F.; and Rowden, George A., to Davy McKee (Minerals & Metals) Limited. Liquid-liquid contacting apparatus. 4,292,277, Cl. 422-259.000.

Boonstra, Alexander H.: *See*—
Mutsaers, Cornelis A. H. A.; and Boonstra, Alexander H., 4,292,619, Cl. 338-308.000.

Bopp, Barbara A.: *See*—
Dren, Anthony T.; and Bopp, Barbara A., 4,292,316, Cl. 424-248.560.

Borel, Albert W., to Phillips Petroleum Co. Silane reinforcing promoters in reinforcement of silica-filled rubbers. 4,292,234, Cl. 260-42.150.

Borg-Warner Corporation: *See*—
Argyle, Charles S.; Bamsey, Robert C.; and Millard, Gregory S. T., 4,291,760, Cl. 165-166.000.
Henao, Alvaro, 4,291,792, Cl. 192-89.00B.
Ross, Louis, 4,291,591, Cl. 74-650.000.

Borgmann, Heinz-Alfred: *See*—
Diegel, Dieter; and Borgmann, Heinz-Alfred, 4,292,534, Cl. 290-40.00R.

Bortfeld, David P.: *See*—
Heyman, Philip M.; and Bortfeld, David P., 4,292,511, Cl. 235-454.000.

Bosco, Peter M.; and Sledzieski, William L., to Standard Brands Incorporated. Low-fat, butter-flavored, liquid spread and process. 4,292,333, Cl. 426-335.000.

Bosso, Joseph F.; Nugent, Richard M.; and Plasynski, Joseph E., to PPG Industries, Inc. Cationic electrodeposition employing novel mercapto chain extended products. 4,292,155, Cl. 204-181.00C.

Boudeville, Jean-Louis: *See*—
Kretz, Francis; and Boudeville, Jean-Louis, 4,292,651, Cl. 358-135.000.

Bourland, Joe D.: *See*—
Geddes, Leslie A.; Bourland, Joe D.; and Terry, Reese S., 4,291,699, Cl. 178-419.00D.

Bow, Kenneth E.; and Lyon, Thomas H., to Dow Chemical Company, The. Cable shielding tape and cable. 4,292,463, Cl. 174-107.000.

Bower, Arnold B., Jr., to General Electric Company. Parallel tube resin capsules. 4,291,799, Cl. 206-219.000.

Bowerman, John J.: *See*—
Wilson, John F.; Hoover, Edward D.; Hammond, Philip K.; Moshier, William A.; Woodell, Jack L.; Spaniol, John W.; Bowerman, John J.; Bieber, Larry C.; and Perlman, Marvin, 4,292,465, Cl. 178-3.000.

Bowes, Emmerson, to Mobil Oil Corporation. Ion exchange and impregnation of catalysts. 4,292,205, Cl. 252-455.00Z.

Bowie, Bruce H.: *See*—
Kerr, Ronald R.; Mullins, Keith M.; and Bowie, Bruce H., 4,292,629, Cl. 340-547.000.

Bowman, Robert J.; and Westenskow, Dwayne R., to University of Utah. Closed-loop infusion system, both method and apparatus, based on real time urine measurement. 4,291,692, Cl. 128-214.00E.

Bowman, Ronald, to Bell & Howell Company. Pressure transducing and methods and apparatus for filling a cavity. 4,291,701, Cl. 128-675.000.

Bracht, Armand. Heat accumulator. 4,291,756, Cl. 165-104.170.

Braddy, Dale E.: *See*—
Petty, Thomas L.; and Baidwan, Balinderjeet S., 4,291,704, Cl. 128-728.000.

Bradler, Peter: *See*—
Auinger, Herbert; Bradler, Peter; Weppler, Rudolf; and Stepina, Jaroslav, 4,292,559, Cl. 310-206.000.

Bradley, John J.: *See*—
Miller, Robert C.; Bradley, John J.; King, Richard L.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,292,668, Cl. 364-200.000.

Brady, Laurence M.: *See*—
Baldwin, Bryce R.; Brady, Laurence M.; and Holcomb, Warren N., 4,292,000, Cl. 403-320.000.

Breiding, Hans-Joachin; and Bachen, Manfred, to G. Siempelkamp GmbH & Co. Hydraulic press. 4,291,569, Cl. 72-403.000.

Breitschwerdt, Werner: *See*—
Schmid, Walter; Breitschwerdt, Werner; and Huber, Guntram, 4,291,919, Cl. 297-483.000.

Brems, Karel A.: *See*—
Pollet, Robert J.; Sels, Francis J.; Brems, Karel A.; and de Ramaix, Maurice A., 4,292,400, Cl. 430-383.000.

Brennan, William M.: *See*—
Williams, Ernest E.; and Brennan, William M., 4,291,867, Cl. 269-43.000.

Brent, Richard W., to Emerson Electric Co. Split-band electric heater. 4,292,503, Cl. 219-535.000.

Brentham, Jerry D. Exercising device with double acting hydraulic cylinder. 4,291,787, Cl. 188-318.000.

Bresan, Joseph R. Stabilizing attachment for hand gun. 4,291,482, Cl. 42-72.000.

Bresson, Raymond; and Ducluzaux, Andre P., to Merlin Gerin S.A. High-speed automatic tripping contactor. 4,292,611, Cl. 335-6.000.

Brett, Dennis A. Vehicle rust-inhibiting spray gun with lighting means. 4,291,839, Cl. 239-289.000.

Breuer, Uwe: *See*—
Stahl, Werner; Breuer, Uwe; Richter, Bernhard; Alstetter, Franz; Krappmann, Franz; and Schuster, Hans, 4,292,177, Cl. 210-325.000.

Breveteam S.A.: *See*—
Tesch, Gunter, 4,292,367, Cl. 428-300.000.

Breze, Vladimir V.: *See*—
Dudko, Daniil A.; Mozzhukhin, Anatoly A.; Breze, Vladimir V.; Kozlov, Anatoly E.; Grigoriev, Veniamin G.; Sotchenko, Vladimir P.; Maximovich, Boleslav I.; Budzan, Bogdan P.; and Zavodian, Vitaly V., 4,292,486, Cl. 219-9.500.

Bridgestone Tire Company Limited: *See*—
Kumagai, Yuzo, 4,292,112, Cl. 156-415.000.
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; and Arai, Katsuhiko, 4,292,361, Cl. 428-215.000.
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; and Kaneda, Hiroshi, 4,292,369, Cl. 428-313.000.

Bridgnell, David G. Heat exchanger core attachment and sealing apparatus and method. 4,291,752, Cl. 165-81.000.

Briggs, Peter J., to Imperial Chemical Industries Limited. Reinforced foam laminates and a process for their manufacture. 4,292,363, Cl. 428-247.000.

Brilando, Frank P.; and Szymski, Eugene J., to Excelsior Fitness Equipment Co. Ergometric exerciser with fluid-actuated indicator. 4,291,872, Cl. 272-73.000.

British-American Tobacco Company Limited: *See*—
Luke, John A., 4,292,032, Cl. 493-43.000.

British Steel Corporation: *See*—
Aftalion, Sebastian, 4,291,743, Cl. 164-66.100.

Brogdex Company: *See*—
Lewis, Philip J., 4,291,472, Cl. 34-31.000.

Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Thio-bis-(hydrocarbon-bisoxazolines) as oleaginous additives for lubricants and fuels. 4,292,184, Cl. 252-46.300.

Bronfen, Petr M.: *See*—
Sanin, Sergei A.; Ponomarenko, Jury F.; Firstov, Vladislav D.; Khorin, Vladimir N.; Ragutsky, Arnold M.; Kostjunin, Boris N.; and Bronfen, Petr M., 4,291,718, Cl. 137-87.000.

Bronstert, Bernd: *See*—
Lechtken, Peter; Bronstert, Bernd; Hoffmann, Gerhard; Vyvial, Rudolf; and Lynch, John, 4,292,152, Cl. 204-159.150.

Brooke, Edric R., to Xerox Corporation. Scanning system. 4,291,973, Cl. 355-71.000.

Brooks, Herbert; and Waite, Frederick A., to Imperial Chemical Industries Limited. Modification of liquid hydrocarbons. 4,292,045, Cl. 44-62.000.

Brotherston, Collin P., to Lucas Industries Limited. Liquid fuel injection pumping apparatus. 4,292,012, Cl. 417-462.000.

Broussely, Michel: *See*—
Lecerf, Andre; and Broussely, Michel, 4,292,382, Cl. 429-197.000.

Brown Company: *See*—
VanderLugt, Thomas, Jr., 4,291,829, Cl. 229-43.000.

Brown, Robert A.: *See*—
Erisman, Lester R.; and Brown, Robert A., 4,292,357, Cl. 428-124.000.

Bruch, Charles A.: *See*—
Gigliotti, Michael F. X.; Jackson, Melvin R.; Henry, Michael F.; Woodford, David A.; Yang, Sherwin S.; and Bruch, Charles A., 4,292,076, Cl. 75-170.000.

Brunsch, Klaus: *See*—
Weiland, Emil; and Brunsch, Klaus, 4,292,009, Cl. 416-134.00A.

Brunswick Corporation: *See*—
Carpenter, Robert L., 4,291,846, Cl. 242-84.20G.

Bruskov, Viktor N.: *See*—
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A., 4,292,494, Cl. 219-76.130.

Buck, Gordon H.; Gabler, Otto L.; Kilroy, Eugene J.; and Leoncavallo, Richard, to Mattel, Inc. Ball throwing machine. 4,291,663, Cl. 124-26.000.

Buckeye Molding Company: *See*—
Allen, David O.; and Wombold, Harry A. E., 4,291,813, Cl. 215-252.000.

Buckler, Robert T.; Burd, John F.; and Wong, Raphael C., to Miles Laboratories, Inc. βGalactosyl-umbelliferone valproic acid conjugates. 4,292,425, Cl. 536-4.000.

Budd Company, The: *See*—
Santos, Gerard R., 4,291,998, Cl. 403-263.000.

Budzan, Bogdan P.: *See*—
Dudko, Daniil A.; Mozzhukhin, Anatoly A.; Breze, Vladimir V.; Kozlov, Anatoly E.; Grigoriev, Veniamin G.; Sotchenko, Vladimir P.; Maximovich, Boleslav I.; Budzan, Bogdan P.; and Zavodian, Vitaly V., 4,292,486, Cl. 219-9.500.

Buelens, Edward, to AGFA-GEVAERT N.V. Light-tight cassette. 4,291,802, Cl. 206-409.000.

Buetemeister, Earl H., to General Motors Corporation. Shift control mechanism for a countershaft transmission. 4,291,586, Cl. 74-335.000.

Buike, James W., to Bendix Corporation, The. Drag flow meter. 4,291,583, Cl. 73-861.750.

Bulle, Marshall; and Johnson, Dale A. Trailer hitch lock. 4,291,557, Cl. 70-58.000.

Bunker Ramo Corporation: *See*—
Stupay, Lawrence J., 4,291,931, Cl. 339-45.00R.

Buob, James F.; and Pauls, Walter L., to American Can Company. Methods of applying bonding materials onto fibrous webs. 4,292,271, Cl. 264-518.000.

Burd, John F.: *See*—
Buckler, Robert T.; Burd, John F.; and Wong, Raphael C., 4,292,425, Cl. 536-4.000.

Burdick, Glenn A. Electrical isolation system for the mast and shrouds of a sailboat. 4,291,639, Cl. 114-39.000.

Burnell, James R.: *See*—
Stinson, John M.; and Burnell, James R., 4,292,067, Cl. 71-29.000.

Burr-Brown Research Corporation: *See*—
Smith, Lewis R., 4,292,595, Cl. 330-10.000.

Burri, Peter, to Ciba-Geigy Corporation. Recording material employing substituted 3,6-diaminophthalides as color formers. 4,291,902, Cl. 282-27.500.

Burroughs Corporation: *See*—
Catiller, Robert D.; and Forbes, Brian K., 4,292,667, Cl. 364-200.000.
Iwan, Wilfred D.; and Gyi, Ko K., 4,292,657, Cl. 360-98.000.
Nelson, Edward I., 4,292,515, Cl. 250-229.000.
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Wollum, James E.; and Rawlings, Robert L., 4,292,669, Cl. 364-200.000.

Butz, David E.; and Pepicelli, Pasquale L., to Data Packaging Corporation. Radioimmunoassay plate. 4,292,273, Cl. 422-102.000.

Buzzell, Colby E.; and Allen, Malcolm H., Jr., to General Electric Company. Mass rate of flow meter with phase shift compensation. 4,291,582, Cl. 73-861.350.

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Nielsen, Jan; and Panek, Karel J., 4,292,297, Cl. 424-1.000.

Byrne, Geoffry A.; and Aylott, Ross I., to Inveresk Research International. Controlled release suppositories. 4,292,300, Cl. 424-19.000.

C. M. Kemp Mfg. Co., The: *See*—
Lehmann, Wallace K., 4,291,719, Cl. 137-112.000.

C. R. Bard, Inc.: *See*—
Williams, Andrew S., 4,291,838, Cl. 239-138.000.

Cabal, Luis A.; and Dali, Carmelo, to Novametrix Medical Systems, Inc. Combined respirator and catheter suction adapter. 4,291,691, Cl. 128-204.180.

Cabot Corporation: *See*—
Tunison, Donald E., III, 4,292,290, Cl. 423-336.000.

Cactus Pipe & Supply Co., Inc.: *See*—
Hardcastle, Phillip, 4,291,889, Cl. 277-116.400.

Caffes, Peter J., to Caffes Trust, The. Solid/liquid separation through liquid vaporization and condensation, and apparatus therefor. 4,292,121, Cl. 159-3.000.

Caffes Trust, The: *See*—
Caffes, Peter J., 4,292,121, Cl. 159-3.000.

Cahn, Robert P.: *See*—
Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., 4,292,181, Cl. 210-638.000.

CamAct Pump Corp.: *See*—
Justice, Orien N., 4,291,588, Cl. 74-421.00R.

Cameron Iron Works, Inc.: *See*—
Miller, Henry W., 4,291,724, Cl. 137-555.000.

Cameron, Ivor, to Imperial Chemical Industries Limited. Radiation method and assembly for assessing web parameters. 4,292,536, Cl. 250-359.000.

Campbell, David A., to Rolls-Royce Limited. Gas turbine engine. 4,291,531, Cl. 60-39.51R.

Campbell, Norma J.: *See*—
Hansen, Robert N., 4,291,893, Cl. 280-507.000.

Campbell, William M.: *See*—
Hansen, Robert N., 4,291,893, Cl. 280-507.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Smithlin, John R., 4,292,626, Cl. 340-347.0DD.

Canadair Limited: *See*—
Lamoureux, Paul, 4,291,816, Cl. 220-243.000.

Canadian Patents & Development Ltd.: *See*—
Kawasaki, Brian S.; Hill, Kenneth O.; and Johnson, Derwyn C., 4,291,940, Cl. 350-96.150.

Cane, Guiseppe: *See*—
Palazzetti, Mario; Becchi, Giorgio; and Cane, Guiseppe, 4,291,834, Cl. 237-12.100.

Cannon, Curtis W.; and Hall, Robert N., to Climax Chemical Company. Process for producing hydrogen fluoride and phosphoric acid. 4,292,289, Cl. 423-301.000.

Canon Kabushiki Kaisha: *See*—
Ikemori, Keiji, 4,291,951, Cl. 350-458.000.
Ito, Tadashi; Murakami, Hiroyasu; Suzuki, Masayuki; Yamamichi, Masayoshi; Sakurada, Nobuaki; and Shinoda, Nobuhiko, 4,291,960, Cl. 354-53.000.
Kanbe, Junichiro; Toyono, Tsutomu; Hosono, Nagao; and Takahashi, Tohru, 4,292,387, Cl. 430-102.000.
Taniishi, Shinnosuke; and Kuge, Tsukasa, 4,291,505, Cl. 51-289.00R.
Yanagawa, Hitoshi; Konishi, Motofumi; Ando, Yoshio; and Kashiwagi, Kazuo, 4,291,843, Cl. 242-57.000.

Carasso, Marino G.; and Verboom, Johannes J., to U.S. Philips Corporation. System incorporating word synchronization for a serial signal sequence. 4,292,655, Cl. 360-40.000.

Carasso, Marino G.: *See*—
de Jager, Frank; Van Doorn, Rudolf A.; Verboom, Johannes J.; and Carasso, Marino G., 4,292,593, Cl. 329-50.000.

Carborundum Company, The: *See*—
Shaffer, Peter T. B.; and Gaffney, Michael F., 4,292,528, Cl. 250-506.000.

Cardenas, Carlos G.; and Ud Din, Zia, to SCM Corporation. Coupling reaction involving a Grignard and allylic halide. 4,292,454, Cl. 585-16.000.

Cardenas, Carlos G.; and Ud Din, Zia, to SCM Corporation. Coupling reaction involving a Grignard and allylic halide. 4,292,459, Cl. 585-641.000.

Cardullo, John J. Air pollution control device and method. 4,292,052, Cl. 55-19.000.

Carleton, Herbert R.: *See*—
Sipin, Anatole J.; and Carleton, Herbert R., 4,292,574, Cl. 318-331.000.

Carlson, Roland W., to Technicare Corporation. Shaped detector. 4,292,538, Cl. 250-367.000.

Carlton, Guy L. Gun barrel cleaning device. 4,291,477, Cl. 42-1.0BC.

Carnahan, James R.: *See—*
Newsom, William D.; and Carnahan, James R., 4,291,433, Cl. 15-405.000.
Carpenter, Robert L., to Brunswick Corporation. Rotor brake for fishing reel. 4,291,846, Cl. 242-84.20G.
Carrier Corporation: *See—*
Shields, J. Rodger, 4,291,540, Cl. 60-694.000.
Carrier Drysys Limited: *See—*
Bloomer, Ivan, 4,292,056, Cl. 55-243.000.
Carrillo, Robert M.: *See—*
Whitemore, Christopher E.; and Carrillo, Robert M., 4,292,356, Cl. 428-116.000.
Cassat, Robert: *See—*
Semanaz, Daniel; and Cassat, Robert, 4,292,500, Cl. 219-345.000.
Catalyst Research Corporation: *See—*
O'Boyle, Matthew; and Magladry, Ross E., 4,292,380, Cl. 429-101.000.
Caterpillar Tractor Co.: *See—*
Goloff, Alexander, 4,291,535, Cl. 60-602.000.
Catiller, Robert D.; and Forbes, Brian K., to Burroughs Corporation. Microprocessor system facilitating repetition of instructions. 4,292,667, Cl. 364-200.000.
Caubere, Paul J.: *See—*
Boileau, Sylvie L.; Caubere, Paul J.; Raynal, Serge F.; Lecolier, Serge L.; and N'Debeka, Gilberte N., 4,292,421, Cl. 526-220.000.
Caunter, Earl G., to Allen R. Shuffleboard Company. Shuffleboard cue with replaceable runner. 4,291,880, Cl. 273-129.00L.
Caverly, Brian L.: *See—*
Ainger, George E.; and Caverly, Brian L., 4,292,338, Cl. 426-603.000.
CEM Corporation: *See—*
Collins, Michael J., 4,291,775, Cl. 177-1.000.
Centro Ricerche Fiat S.p.A.: *See—*
Palazzetti, Mario; Becchi, Giorgio; and Cane, Guiseppe, 4,291,834, Cl. 237-12.100.
Cepulis, Rimoydas L.: *See—*
Bartek, Joseph P.; Cepulis, Rimoydas L.; and Grasselli, Robert K., 4,292,455, Cl. 585-320.000.
Ceraver: *See—*
Willem, Michel, 4,291,741, Cl. 164-9.000.
Cesarz, Michael R.; and Stobbe, Richard E., to Kearney & Trecker Corporation. A.C. Motor control circuit. 4,292,577, Cl. 318-802.000.
Ceva: *See—*
Ostre, Louis, 4,292,331, Cl. 426-52.000.
Chae, Yung B.: *See—*
Kim, Choong S.; Lee, Kee J.; Kim, Hong S.; and Chae, Yung B., 4,292,431, Cl. 548-342.000.
Chai, S. Apparatus and method for performing a thoracic operation. 4,291,694, Cl. 128-214.400.
Chamberlin, Ronald D., to PPG Industries, Inc. Method of preparing electrocatalyst for an oxygen depolarized cathode electrolytic cell. 4,292,197, Cl. 252-425.300.
Champion International Corporation: *See—*
Austin, John J., 4,291,806, Cl. 206-620.000.
Mulroy, Terence J., 4,291,827, Cl. 229-39.00R.
Chance, Davey J.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,292,490, Cl. 219-69.00P.
Chang, Eng-Pi; Lazarz, Christine A.; and Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corp. Porous polyfluoroalkylene sheet useful for separating anolyte from catholyte in electrolytic cells. 4,292,146, Cl. 204-98.000.
Chang, Oscar: *See—*
Suarez, Ricardo; Chang, Oscar; and Adam, Vladimir, 4,292,548, Cl. 307-465.000.
Chao, Chris C., to Textron Inc. Removal of titanium dioxide from a filter element. 4,292,090, Cl. 134-2.000.
Charchian, Loris J.; Emmons, Donald O.; and Zlotek, Thaddeus F. Coupling lubrication system. 4,291,795, Cl. 192-113.00B.
Chardon, Max M. F. Seat for bus, train or airplane. 4,291,916, Cl. 297-367.000.
Charette, George F. Leakage current testing circuit. 4,292,585, Cl. 324-51.000.
Chase, Terry J.: *See—*
Faitani, Joseph J.; Austin, George W.; Chase, Terry J.; Suljak, George T.; and Misage, Robert J., 4,292,274, Cl. 422-197.000.
Chataignon, Andre; Nicolas, Alain; and Poirier, Jean P., to Le Materiel Telephonique Thomson-CSF. Separation and balance device for telephone exchanges. 4,292,479, Cl. 179-170.0NC.
Chen-Hsiung, Wu. Intermittent water-supply system. 4,291,836, Cl. 239-37.000.
Chen, Johnson C., to Pennwalt Corporation. Thermal energy storage composition comprising sodium sulfate decahydrate; sodium carbonate decahydrate; and sodium tetraborate decahydrate. 4,292,189, Cl. 252-70.000.
Cheney, Paul G.: *See—*
Riedel, John E.; and Cheney, Paul G., 4,292,360, Cl. 428-171.000.
Cherney, Thomas M.: *See—*
Binek, Paul H.; Cherney, Thomas M.; Magnusson, John M.; and Cronk, Bryon J., 4,291,943, Cl. 350-96.220.
Cherry, Gary D., to Sladco, Inc. Brake apparatus for power wrench. 4,291,598, Cl. 81-57.150.
Cheung, Nim K., to Bell Telephone Laboratories, Incorporated. Molding optical fiber connectors. 4,292,260, Cl. 264-1.500.
Chibnik, Sheldon; Otto, Ferdinand P., deceased; and Otto, Helen F., executrix, to Mobil Oil Corporation. Metal complexes of alkylsuccinic compounds as lubricant and fuel additives. 4,292,186, Cl. 252-49.700.
Chicago Bridge & Iron Company: *See—*
Engdahl, Gerald E.; and Maher, James B., 4,291,550, Cl. 62-544.000.
Husain, Matloob; Lai, Ban-Yen; and Maher, James B., 4,291,538, Cl. 60-661.000.
Chilcote, Dennis D.; and Kaczyski, Donald J., to Hanna Mining Company, The. Selective leaching of chloride from copper oxide minerals. 4,292,281, Cl. 423-27.000.
Chin, HsuS. Multi-purpose surveying instrument. 4,291,982, Cl. 356-249.000.
Chisso Corporation: *See—*
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; Kitahara, Tohru; and Watanabe, Kenichi, 4,292,433, Cl. 556-479.000.
Chrysler Corporation: *See—*
Lewakowski, John J.; and Ciagala, Theodore M., 4,291,563, Cl. 72-216.000.
Chu, Hing C.; and Sun, Y. S. Edmund, to General Electric Company. Control of valley current in a unijunction transistor by electron irradiation. 4,292,644, Cl. 357-21.000.
Chu, Victor F. H.; and Riesenfeld, James, to Du Pont de Nemours, E. I., and Company. Process for preparing multicolor toned images on a single photosensitive layer. 4,292,394, Cl. 430-291.000.
Chubb Fire Security Limited: *See—*
Simmons, Richard R.; and Thompson, Harvey A., 4,292,513, Cl. 250-205.000.
Chubb Industries Limited: *See—*
Sadler, John A., 4,292,628, Cl. 340-531.000.
Churchman, Ronald K., to Otis Engineering Corporation. Drill string safety and kill valve. 4,291,722, Cl. 137-496.000.
Ciagala, Theodore M.: *See—*
Lewakowski, John J.; and Ciagala, Theodore M., 4,291,563, Cl. 72-216.000.
Ciallella, John G.: *See—*
Gordon, Richard; and Ciallella, John G., 4,291,815, Cl. 220-200.000.
Ciba-Geigy Corporation: *See—*
Burri, Peter, 4,291,902, Cl. 282-27.500.
Dazzi, Joachim; Jost, Max; and Wick, Arnold, 4,292,232, Cl. 260-40.00P.
Galafassi, Pierre; Adam, Jean-Marie; Loew, Peter; and Scheidegger, Hans, 4,292,037, Cl. 8-554.000.
Marxer, Adrian, 4,292,429, Cl. 546-278.000.
Petitpierre, Jean C., 4,291,901, Cl. 282-27.500.
Cirkler, Werner; and Krueger, Hans, to Siemens Aktiengesellschaft. Process for making a liquid crystal cell. 4,291,947, Cl. 350-336.000.
Citizen Watch Company Limited: *See—*
Morokawa, Shigeru; Sekiya, Fukuo; Hashimoto, Yukio; Nomura, Yasushi; and Koga, Keiichiro, 4,292,680, Cl. 368-187.000.
Claes, Ludo: *See—*
Denecker, Gabriel; Sluyts, Domien; Putseys, Roland; Van Herck, Willy; Claes, Ludo; and Spott, Georg, 4,292,043, Cl. 23-296.000.
Clairol Incorporated: *See—*
Mack, William, 4,292,664, Cl. 362-120.000.
Clardey, Johannes G.: *See—*
Koster, Hendrikus J.; Bik, Johannes T. J.; Clardey, Johannes G.; and Smorenberg, Dirk, 4,291,712, Cl. 131-339.000.
Clark, Constance C., executrix: *See—*
Clark, Trevor P., deceased; and Clark, Constance C., executrix, 4,292,086, Cl. 106-172.000.
Clark, Keith E., to United States of America, Navy. Missile seeker optical system. 4,291,848, Cl. 244-3.160.
Clark-Schwebel Fiber Glass Corp.: *See—*
Herschdorfer, C. George; and Vaughan, Dennis J., 4,292,106, Cl. 156-243.000.
Clark, Trevor P., deceased; and by Clark, Constance C., executrix. All weather wood sealer and marker. 4,292,086, Cl. 106-172.000.
Clark, Warren P. Apparatus for controlling power application. 4,292,546, Cl. 307-114.000.
Claussen, Paul O., to Schloemann-Siemag Aktiengesellschaft. Forging press. 4,291,571, Cl. 72-453.180.
Clavier, Philippe, to Spie-Batignolles. Device for desalting sea or brackish water by using solar energy. 4,292,136, Cl. 202-234.000.
Clements, Robert: *See—*
Hansen, Robert N., 4,291,893, Cl. 280-507.000.
Click, Bobbie J. Flower holder. 4,291,496, Cl. 47-55.000.
Climax Chemical Company: *See—*
Cannon, Curtis W.; and Hall, Robert N., 4,292,289, Cl. 423-301.000.
Clyne, Arthur J.; Knarr, John E.; and Miller, Stanley, to Energy Recycling Company. Selective extraction heat storage unit. 4,291,750, Cl. 165-34.000.
Coatantiec, Alain, to Societe Anonyme Automobiles Citroen; and Automobiles Peugeot. Clamping jaws assembly. 4,291,909, Cl. 294-88.000.
Coates, David: *See—*
Crossland, William A.; Morrissy, Joseph H.; and Coates, David, 4,291,948, Cl. 350-340.000.
Coca-Cola Company, The: *See—*
Richter, Simon J.; and Sanscharowskiy, Michael, 4,291,573, Cl. 73-37.000.
Codrington, Ernest R. Diesel engine speed governor. 4,291,657, Cl. 123-387.000.
Cogswell, Arthur R. Anchor chain cleaning brush. 4,291,432, Cl. 15-160.000.
Cohen, Robert S. Ball recovery system. 4,291,885, Cl. 273-347.000.

Cole, James E.; and Thornton, Peter, to Gould Inc. Catheter flushing apparatus. 4,291,702, Cl. 128-675.000.
Colgate-Palmolive Company: *See—*
Gray, Frederick W., 4,292,191, Cl. 252-99.000.
Collet, Marnix G.: *See—*
Appels, Johannes A.; Collet, Marnix G.; Hart, Paul A. H.; and Verhoeven, Johannes F. C. M., 4,292,642, Cl. 357-13.000.
Collins, John D.; and Wood, Donald A., to Tenneco Chemicals Inc. Process for preparing organotin esters. 4,292,252, Cl. 260-429.700.
Collins, Michael J., to CEM Corporation. Method and apparatus for improving weighing accuracy. 4,291,775, Cl. 177-1.000.
Colt Industries Operating Corp.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,292,490, Cl. 219-69.00P.
Combustion Engineering, Inc.: *See—*
Schukei, Glen E.; Horlacher, Walter R., III; and Sampson, William T., 4,292,132, Cl. 176-36.00S.
Cominco Ltd.: *See—*
Laurie, Gordon H.; Seymour, Theodore J.; Sakauye, Randall T.; and Marlow, John V., 4,291,443, Cl. 29-6.100.
Commercial Shearing, Inc.: *See—*
Singer, Carl M.; and Ratkay, Edward J., 4,292,013, Cl. 418-132.000.
Communications Technology Corp.: *See—*
Kund, August, 4,291,934, Cl. 339-95.00R.
Compagnie Europeenne pour l'Equipement Menager "CEPEM": *See—*
Maitenaz, Paul, 4,292,501, Cl. 219-413.000.
Compagnie Generale de Radiologie: *See—*
Gabbay, Emile; Tran Quang, Dang; and Lafitte, Andre, 4,292,563, Cl. 313-56.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
David, Jacques; and Mionet, Hubert, 4,292,594, Cl. 329-50.000.
Compool Corporation: *See—*
Bajka, Peter, 4,292,542, Cl. 307-28.000.
Composite Container Corporation: *See—*
Bonis, Laszlo J., 4,292,355, Cl. 428-35.000.
Comte, Paul Y.; and Repetti, Rene J., to Agence Nationale de Valorisation de la Recherche. Processes and devices for climatizing greenhouses. 4,291,674, Cl. 126-419.000.
Concast Incorporated: *See—*
Langner, Carl, 4,291,748, Cl. 164-426.000.
Conn, John L. Container with drinking tube. 4,291,814, Cl. 220-90.400.
Conoco, Inc.: *See—*
Dodd, John R., 4,292,450, Cl. 568-788.000.
Sooter, Matthew C., 4,292,165, Cl. 208-8.0LE.
Consolidated Refining Co., Inc.: *See—*
Gordon, Richard; and Ciallella, John G., 4,291,815, Cl. 220-200.000.
Constant, James N. Thermoelectric generator. 4,292,579, Cl. 322-2.00R.
Continental Group, Inc., The: *See—*
Gerber, Howard L., 4,292,489, Cl. 219-10.710.
Payne, Robert D.; and Jordan, Thomas F., 4,291,640, Cl. 118-50.100.
Schlinsog, Hans-Juergen, 4,292,095, Cl. 148-6.14R.
Cook, Edward H., Jr.: *See—*
Chang, Eng-Pi; Lazarz, Christine A.; and Cook, Edward H., Jr., 4,292,146, Cl. 204-98.000.
Cools, Antoon S. P., to Sperry Corporation. Row crop apparatus. 4,291,523, Cl. 56-94.000.
Corder, E. E., to A.S.M., Inc. Shearing device. 4,291,462, Cl. 30-221.000.
Corning Glass Works: *See—*
Heimbach, Kim P.; and Johnson, Ronald E., 4,292,104, Cl. 156-235.000.
Martin, Francis W., 4,292,080, Cl. 501-4.000.
Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno. Low viscosity unsaturated polyester resins. 4,292,218, Cl. 260-22.0CB.
Corsini, Tullio: *See—*
Piccolo, Luigi; Corsini, Tullio; Paolinelli, Antonio; Ferri, Gaudenzio; and La Rovere, Angelo, 4,292,085, Cl. 106-109.000.
Cota, Marlo E.; and Gurtler, Richard W., to Motorola, Inc. Method for producing polycrystalline ribbon. 4,292,264, Cl. 264-81.000.
Cothran, Liggett A., to Dayco Corporation. Hose construction. 4,291,728, Cl. 138-122.000.
Coulthard, T. Lionel; Townsley, Philip M.; and Saben, Hugh S. Thermophilic aerobic digestion process for producing animal nutrients and other digested products. 4,292,328, Cl. 426-2.000.
Covington Brothers, Inc.: *See—*
Artzer, Richard F., 4,291,732, Cl. 140-112.000.
Covington, William S., to Permavision. Ocular membrane and method for preparation thereof. 4,291,953, Cl. 351-160.00H.
Cox, Jeanette. Combined suitcase and child's safety seat. 4,291,915, Cl. 297-193.000.
Cox, Larry R., to United States of America, Navy. Electrical connector receptacle assembly. 4,291,932, Cl. 339-60.00R.
Cragoe, Edward J., Jr.: *See—*
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., 4,292,430, Cl. 548-206.000.
Craig, Robert G.; and Douglas, William H., to University of Michigan. Hydrophobic composite restorative materials and their use in tooth treatment. 4,292,029, Cl. 433-228.000.
Craven Tasker (Andover) Limited: *See—*
Renwick, Peter J., 4,291,638, Cl. 111-61.000.
Cremonesi, Pietro, to Italfarmaco S.p.A. Flow reactor for enzymatic reactions in which the enzyme is immobilized on a solid matrix having a planar surface. 4,292,409, Cl. 435-288.000.
Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T., to Turbine Components Corporation. Method of restoring the shrouds of turbine blades. 4,291,448, Cl. 29-156.80B.
Crippen, Michael R. Apparatus and method for driving stakes. 4,291,495, Cl. 47-23.000.
Criss, George H.: *See—*
Thrower, Stephen W.; Criss, George H.; and Kleeb, Thomas R., 4,292,084, Cl. 501-107.000.
Cronk, Bryon J.: *See—*
Binek, Paul H.; Cherney, Thomas M.; Magnusson, John M.; and Cronk, Bryon J., 4,291,943, Cl. 350-96.220.
Crossland, William A.; Morrissy, Joseph H.; and Coates, David, to International Standard Electric Corporation. Liquid crystal display incorporating positive and negative smectic material. 4,291,948, Cl. 350-340.000.
Crouch, Keith E.: *See—*
Steigerwald, Robert L.; Crouch, Keith E.; and Wilson, James W. A., 4,292,578, Cl. 320-9.000.
Cruchelow, Marilyn: *See—*
Cruchelow, Wayne L.; and Cruchelow, Marilyn, 4,291,645, Cl. 119-19.000.
Cruchelow, Wayne L.; and Cruchelow, Marilyn. Pet shelter. 4,291,645, Cl. 119-19.000.
Crum, John E.: *See—*
Hersom, Wallace N.; and Crum, John E., 4,292,665, Cl. 363-141.000.
CTS Corporation: *See—*
Bloom, Terry R., 4,291,471, Cl. 34-12.000.
Geddes, Leslie A.; Bourland, Joe D.; and Terry, Reese S., 4,291,699, Cl. 178-419.00D.
Culbertson, Billy M.: *See—*
Gabriel, Hans R. L.; Post, Larry K.; Culbertson, Billy M.; and Graham, Curtis M., 4,292,231, Cl. 260-33.4UR.
Cummins Engine Company, Inc.: *See—*
Reid, David L.; and Taylor, Dennis O., 4,292,670, Cl. 364-431.000.
Cuneo, Giuseppe, to Black & Decker Inc. Control device for controlling the rotational speed of a portable power tool. 4,292,571, Cl. 318-17.000.
Curtin, Denis J.: *See—*
Blanchette, Robert G.; and Curtin, Denis J., 4,292,385, Cl. 430-58.000.
Curtiss-Wright Corporation: *See—*
DeFeo, Angelo; and Hosek, William S., 4,292,023, Cl. 431-170.000.
Hosek, William S., 4,292,022, Cl. 431-170.000.
Dai Nippon Printing Co., Ltd.: *See—*
Takeuchi, Satoshi; Akada, Masanori; Fujii, Hitoshi; Toida, Takashi; Takamizawa, Minoru; and Inoue, Yoshio, 4,292,397, Cl. 430-303.000.
Daicel Ltd.: *See—*
Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya, Hitoshi, 4,292,417, Cl. 525-510.000.
Daimler-Benz Aktiengesellschaft: *See—*
Schmid, Walter; Breitschwerdt, Werner; and Huber, Guntram, 4,291,919, Cl. 297-483.000.
Dainippon Pharmaceutical: *See—*
Pesson, Marcel, 4,292,317, Cl. 424-250.000.
Dali, Carmelo: *See—*
Cabal, Luis A.; and Dali, Carmelo, 4,291,691, Cl. 128-204.180.
Dalrymple, Philip W.; Hyle, Michael J.; Myers, Daryl L.; and Wright, James G., Jr., to Western Electric Company, Inc. Methods of and apparatus for taking up lightguide fiber. 4,291,841, Cl. 242-18.00A.
Damiano, Victor V.: *See—*
Baldi, Alfonso L.; and Damiano, Victor V., 4,292,208, Cl. 252-470.000.
Danfoss A/S: *See—*
Larsen, Kurt A., 4,291,544, Cl. 62-221.000.
Daniels, Robert J., to Monsanto Company. Isolation and determination of nitrosoamines. 4,292,040, Cl. 23-230.00R.
Danjyo, Hiroyuki; Okuda, Shigeru; and Yorita, Eiichi, to Shinagawa Refractories Co. Ltd. Unshaped refractories. 4,292,082, Cl. 501-100.000.
D'Antonio, Nicholas F.; and Bates, Richard L. Electrical ski boot release. 4,291,894, Cl. 280-612.000.
Daren, Stephen L. J.; Vofsi, David; and Asscher, Meir, to Makhteshim Chemical Works Ltd. Process for preparing ring halogenated styrenes. 4,292,453, Cl. 570-193.000.
Data Packaging Corporation: *See—*
Butz, David E.; and Pepicelli, Pasquale L., 4,292,273, Cl. 422-102.000.
David, Jacques; and Mionet, Hubert, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Method and apparatus for carrier regeneration and synchronous amplitude demodulation. 4,292,594, Cl. 329-50.000.
Davies, David H. K.: *See—*
van Hoogstraten, Samuel D.; and Davies, David H. K., 4,292,068, Cl. 71-88.000.
Davies, David R.; Zuiderwijk, Jacobus J. M.; and Hagelaars, Adrianus M. P. M., to Shell Oil Company. Process for consolidating water-wet sands with an epoxy resin-forming solution. 4,291,766, Cl. 166-276.000.
Davies, Graham, to Service (Engineers) Limited. Manufacture of ceramic ware. 4,292,006, Cl. 409-131.000.
Davies, Terence J.; Franks, Larry A.; and Nelson, Melvin A., to United States of America, Energy. System for testing optical fibers. 4,292,537, Cl. 250-361.00R.

Davis, Adrian F., to Beecham Group Limited. Pharmaceutical compositions containing paracetamol. 4,292,298, Cl. 424-10.000.

Davis, Grant L.: *See*—
Weiss, Olin E.; Davis, Grant L.; Hudson, James L.; and Dowell, Harlan T., 4,292,108, Cl. 156-259.000.

Davis, John C. H.; and Natarajan, Krishnaswamy, to Plessey Canada Limited. Interface circuits. 4,292,478, Cl. 179-170.0NC.

Davis, Pauls; Maxwell, Jerrold F.; and Wilson, Joe C., to BASF Wyandotte Corporation. Corrosion inhibited aqueous compositions containing tertiary, bicyclic, or tricyclic amines. 4,292,190, Cl. 252-75.000.

Davy McKee (Minerals & Metals) Limited: *See*—
Bonney, Christopher F.; and Rowden, George A., 4,292,277, Cl. 422-259.000.

Dawson, Gerald G.: *See*—
Probyn, Keith A.; Nolen, Richard W.; Erickson, Charles W.; Dawson, Gerald G.; Goldstein, Ralph; and Bender, Max, 4,292,034, Cl. 493-92.000.

Day, Edward G., to General Motors Corporation. Power brake system differential air pressure control valve assembly. 4,291,612, Cl. 91-6.000.

Dayco Corporation: *See*—
Cothran, Liggett A., 4,291,728, Cl. 138-122.000.
Mathieu, Julien C., 4,291,453, Cl. 29-417.000.

Dazzi, Joachim; Jost, Max; and Wick, Arnold, to Ciba-Geigy Corporation. Process for the mass coloration of thermoplastics with anthraquinonylaminotraizines. 4,292,232, Cl. 260-40.00P.

Dean, Robert S.: *See*—
Reckin, George M.; Lofy, Richard A.; and Dean, Robert S., 4,291,500, Cl. 49-68.000.

Deane, Kenneth E., to Emhart Industries, Inc. Electrical temperature sensing means having moisture tight seals. 4,291,576, Cl. 73-352.000.

deBerardinis, Albert J.; and Kruse, Walter M., to ICI Americas Inc. High mannitol process (alkaline hydrogenation in presence of alkali metal carbonate). 4,292,451, Cl. 568-863.000.

De Capitani, Francesco. Cigarettes having an individual lighting structure. 4,291,710, Cl. 131-351.000.

De Castella, Pierre M. T.; and Reinhold, Charles L. Purifier for gaseous fluids. 4,292,055, Cl. 55-233.000.

Deere & Company: *See*—
Stecklein, Gary L., 4,292,002, Cl. 403-376.000.

DeFeo, Angelo; and Hosek, William S., to Curtiss-Wright Corporation. Fluidized bed combustor and removable windbox and tube assembly therefor. 4,292,023, Cl. 431-170.000.

Degussa Aktiengesellschaft: *See*—
Kunst, Helmut; and Scondo, Christian, 4,292,094, Cl. 148-6.110.

de Jaeger, Nikolaas C.: *See*—
Pollet, Robert J.; Kokelenberg, Hendrik E.; Samijn, Rafael P.; Sels, Francis J.; Ville, Frans J.; and de Jaeger, Nikolaas C., 4,292,402, Cl. 430-631.000.

de Jager, Frank; Van Doorn, Rudolf A.; Verboom, Johannes J.; and Carasso, Marino G., to U.S. Philips Corporation. Method of demodulating a quadphase coded data signal and receiver for carrying out the method. 4,292,593, Cl. 329-50.000.

De Jong, Hendrikus: *See*—
Pelt, Cornelis P.; and De Jong, Hendrikus, 4,291,854, Cl. 246-271.000.

de Klerk, John: *See*—
Weinert, Robert W.; and de Klerk, John, 4,292,608, Cl. 333-141.000.

Del Mar Avionics: *See*—
Kelen, George J., 4,291,703, Cl. 128-711.000.

Delasko, Joseph M.: *See*—
Birdwell, James A.; and Delasko, Joseph M., 4,292,592, Cl. 328-233.000.

De Leon, Noel, to Topsil A/S. Method for initiating the float zone melting of semiconductors. 4,292,487, Cl. 219-10.430.

Del Monte, Samie J. Bingo card holder. 4,291,882, Cl. 273-148.00A.

DeLuca, Hector F.; Schnoes, Heinrich K.; and LeVan, Leon W., to Wisconsin Alumni Research Foundation. Vitamin D derivatives. 4,292,250, Cl. 260-397.200.

De Mattei, Robert C.; Elwell, Dennis; and Feigelson, Robert S., to Leland Stanford Junior University, The Board of Trustees of. Electrodeposition of molten silicon. 4,292,145, Cl. 204-60.000.

DeMusis, Ralph T.: *See*—
Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T., 4,291,448, Cl. 29-156.80B.

Den-Mat, Inc.: *See*—
Ibsen, Robert L.; and Reed, William R., Jr., 4,292,236, Cl. 260-42.520.

Denecker, Gabriel; Sluyts, Domien; Putseys, Roland; Van Herck, Willy; Claes, Ludo; and Spott, Georg, to Bayer Antwerpen. Process for working up effluent containing ammonium sulphate. 4,292,043, Cl. 23-296.000.

Denis, Bernard A., to International Business Machines Corp. Five device merged transistor RAM cell. 4,292,675, Cl. 365-156.000.

Dennis, James T.; and Kolomayets, George, to Dennis, James T. Automatic record changer. 4,291,886, Cl. 369-203.000.

De Pinto, Victor M.: *See*—
Hill, Stephen R.; De Pinto, Victor M.; and Gillen, John D., 4,292,475, Cl. 179-99.00A.

Deputato, Frank V. Apparatus for generating mechanical energy responsive to interaction of magnetic fields. 4,292,553, Cl. 310-46.000.

de Ramaix, Maurice A.: *See*—
Pollet, Robert J.; Sels, Francis J.; Brems, Karel A.; and de Ramaix, Maurice A., 4,292,400, Cl. 430-383.000.

Derbyshire, Francis J.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Liquefaction of carbonaceous material with hydrogen and naphtha-extracted recycle solvent without heterogeneous catalyst. 4,292,164, Cl. 208-8.0LE.

Derbyshire, Francis J.; Mitchell, Thomas O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Upgrading heavy oils by non-catalytic treatment with hydrogen and hydrogen transfer solvent. 4,292,168, Cl. 208-107.000.

Derndinger, Walter: *See*—
Hetz, Walter; and Derndinger, Walter, 4,291,578, Cl. 73-633.000.

Derroitte, Jean-Louis: *See*—
Berger, Eugene; and Derroitte, Jean-Louis, 4,292,200, Cl. 252-431.00C.

DeTorre, Robert P., to PPG Industries, Inc. Self-aligning method for scoring fracturable material. 4,291,824, Cl. 225-2.000.

Deutsch Company Electronic Components Division, The: *See*—
Melzer, Erich G., 4,291,941, Cl. 350-96.180.

Deutsche Babcock Aktiengesellschaft: *See*—
Noack, Rolf; and Gramelt, Stefan, 4,292,054, Cl. 55-181.000.

Deutsche Gold- Und Silber-Scheideanstalt Vormals Roessler: *See*—
Rothbuhr, Lothar; and Witte, Josef, 4,292,291, Cl. 423-450.000.

Deutz, Roger T. Passive solar roof ice melter. 4,291,673, Cl. 126-417.000.

Devanney, Raymond H., to Veeder Industries Inc. Fuel pump computer price variator. 4,292,506, Cl. 235-61.00L.

Dhein, Rolf: *See*—
Hentschel, Karl-Heinz; Dhein, Rolf; and Schule, Wolfgang, 4,292,187, Cl. 252-49.500.

Diegel, Dieter; and Borgmann, Heinz-Alfred, to Kraftwerk Union AG. Power and speed control device for a turbo-generator set. 4,292,534, Cl. 290-40.00R.

Diehl, Robert J., to W-K-M Wellhead Systems, Inc. Packing assembly for wellheads. 4,291.768, Cl. 166-315.000.

Diethelm, Eugen, to Grissman Chemicals Limited. Product and method for combating swine dysentery. 4,292,318, Cl. 424-250.000.

Dietz, Hermann: *See*—
Muller, Klaus; Maurer, Helmut; Dietz, Hermann; Friese, Karl-Hermann; Leibfried, Wolfgang; Stecher, Gunther; and Linder, Ernst, 4,292,158, Cl. 204-195.00S.

DiFrancesco, Alphonse B., to Eastman Kodak Company. Apparatus for producing duplex copies. 4,291,970, Cl. 355-3.00R.

Diggs, Richard E. Modular current power apparatus. 4,292,535, Cl. 290-54.000.

Dikoff, Joseph K., to Tasis, Elizabeth A. Toothbrush with re-fillable paste reservoir. 4,291,995, Cl. 401-175.000.

Dillman, Gerhard: *See*—
Maurer, Helmut; Dillman, Gerhard; Rieger, Franz; and Linder, Ernst, 4,291,572, Cl. 73-23.000.

Dinger, Leon J., to AMP Incorporated. Method for environmentally sealing a wire splice. 4,292,099, Cl. 156-49.000.

Dinsdale, Raymond, to Rolls-Royce Limited. Method of and apparatus for forging metal. 4,291,566, Cl. 72-342.000.

Dinulescu, Horia A.; and Sanders, Nicholas A. Cryogenic fuel tank. 4,292,062, Cl. 62-7.000.

Di Palma, Ralph; and Phillips, Arthur, to Duracell International Inc. Bilevel rechargeable cell. 4,292,383, Cl. 429-219.000.

Director-General of the Agency of Industrial Science and Technology: *See*—
Watanabe, Tadahiko; and Kono, Shinichi, 4,292,081, Cl. 501-96.000.

Dixon, Richard G., Jr.; and Watkins, Wendell R., to United States of America, Army. Automated path differencing system. 4,291,988, Cl. 356-437.000.

Dobashi, Masashi: *See*—
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.

Dodd, John R., to Conoco, Inc. Selective alkylation of 2,5-xylenol in the presence of 2,4-xylenol. 4,292,450, Cl. 568-788.000.

Dodds, Alan R.: *See*—
Homeier, Edwin H.; Dodds, Alan R.; and Imai, Tamotsu, 4,292,196, Cl. 252-412.000.

Doepel, Wallace A. Apparatus for compressing tablets. 4,292,017, Cl. 425-107.000.

Dolan, Calvin M., to Johnson Matthey, Inc. Low density ceramic insulating. 4,292,348, Cl. 427-299.000.

Dolibois, Ewald, deceased; and Dolibois, Rose V., administratrix, to Dolibois, Rose. Anti-skid mechanism for wheeled vehicle. 4,291,922, Cl. 301-46.000.

Dolibois, Rose: *See*—
Dolibois, Ewald, deceased; and Dolibois, Rose V., administratrix, 4,291,922, Cl. 301-46.000.

Dolibois, Rose V., administratrix: *See*—
Dolibois, Ewald, deceased; and Dolibois, Rose V., administratrix, 4,291,922, Cl. 301-46.000.

Domkowski, Ronald A., to Honor Gard, Inc. Security housing. 4,291,831, Cl. 232-15.000.

Domtar Inc.: *See*—
Karnis, Alkibiadis; and Wood, John R., 4,292,122, Cl. 162-28.000.

Donachie, Stephen J.: *See*—
Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., 4,292,079, Cl. 75-232.000.

Donbavand, Martin H. Device for locking and sealing standard cone-socket joints for laboratory apparatus. 4,291,906, Cl. 285-332.000.

Donley, Harold E., to PPG Industries, Inc. Pyrolytic coating reactant for defect and durability control. 4,292,347, Cl. 427-168.000.

Dorokhov, Vasily I.: *See—*
Korytov, Vladimir A.; Maljushevsky, Pavel P.; Guly, Grigory A.; Shkatov, Alexandr S.; Sladkosh teev, Vladimir T.; Patanin, Ruslan V.; Dorokhov, Vasily I.; Klemeshov, Georgy A.; and Arkulis, Grigory E., 4,291,742, Cl. 164-501.000.

Doss, James D. Ignition performance monitor for permanent installation. 4,292,591, Cl. 324-395.000.

Dotson, Ronald L.: *See—*
Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,292,159, Cl. 204-237.000.

Douglas, William H.: *See—*
Craig, Robert G.; and Douglas, William H., 4,292,029, Cl. 433-228.000.

Dow Chemical Company, The: *See—*
Bow, Kenneth E.; and Lyon, Thomas H., 4,292,463, Cl. 174-107.000.
Hay, Robert A.; and Bergman, Oswald, 4,292,019, Cl. 425-325.000.

Dow Corning Corporation: *See—*
Homan, Gary R.; and Lee, Chi-Long, 4,292,422, Cl. 528-15.000.

Dowell, Harlan T.: *See—*
Weiss, Olin E.; Davis, Grant L.; Hudson, James L.; and Dowell, Harlan T., 4,292,108, Cl. 156-259.000.

Dowty Fuel Systems Limited: *See—*
Robinson, Keith, 4,291,532, Cl. 60-223.000.

Dren, Anthony T.; and Bopp, Barbara A., to Abbott Laboratories. Antiglaucoma agents. 4,292,316, Cl. 424-248.560.

Dresser Industries, Inc.: *See—*
Birdwell, James A.; and Delasko, Joseph M., 4,292,592, Cl. 328-233.000.
Ivy, Joel G., 4,292,572, Cl. 318-52.000.
Thrower, Stephen W.; Criss, George H.; and Kleeb, Thomas R., 4,292,084, Cl. 501-107.000.

Dreyhaupt, Dieter: *See—*
Berthold, Gert; Dreyhaupt, Dieter; Dunse, Helmfried; Henker, Erich; and Viehweg, Bernd, 4,291,892, Cl. 280-28.000.

Drill Tech Equipment, Inc.: *See—*
Gudgel, Howard S., 4,291,762, Cl. 166-85.000.

Du Bae, Hyung, to International Telephone and Telegraph Corporation. Viscosimeter. 4,292,673, Cl. 364-509.000.

Ducluzaux, Andre P.: *See—*
Bresson, Raymond; and Ducluzaux, Andre P., 4,292,611, Cl. 335-6.000.

Dudko, Daniil A.; Mozzhukhin, Anatoly A.; Breze, Vladimir V.; Kozlov, Anatoly E.; Grigoriev, Veniamin G.; Sotchenko, Vladimir P.; Maximovich, Boleslav I.; Budzan, Bogdan P.; and Zavodian, Vitaly V. Apparatus for delivery of melting rings and valves to an inductor heater. 4,292,486, Cl. 219-9.500.

Duermeyer, Willem, to Akzona Incorporated. Detection and/or determination of IgM, IgA, IgD and IgE immunoglobulins. 4,292,403, Cl. 435-5.000.

Dugger, Gordon L.; and Billig, Frederick S., to United States of America, Navy. Supersonic ramjet missile. 4,291,533, Cl. 60-240.000.

Dumont, Claude, to Societe d'Etudes Techniques et Commerciales d'Automation. Device for the obtaining of an electric signal which is proportional to an amount of movement and therefore capable of detecting any movement or acceleration. 4,292,630, Cl. 340-573.000.

Dunse, Helmfried: *See—*
Berthold, Gert; Dreyhaupt, Dieter; Dunse, Helmfried; Henker, Erich; and Viehweg, Bernd, 4,291,892, Cl. 280-28.000.

Duphar International Research B.V.: *See—*
Bekkering, Hendrik M.; and Schmidt, Ernst M., 4,291,695, Cl. 128-218.0NV.

Du Pont de Nemours, E. I., and Company: *See—*
Chu, Victor F. H.; and Riesenfeld, James, 4,292,394, Cl. 430-291.000.
Krespan, Carl G., 4,292,449, Cl. 568-649.000.
Moynihan, Robert E., 4,292,372, Cl. 428-437.000.
Nacci, George R., 4,292,120, Cl. 156-660.000.
Overman, Joseph D., 4,292,391, Cl. 430-267.000.
Squire, Edward N.; and Waller, Francis J., 4,292,437, Cl. 560-233.000.

Du Prez, Eddie: *See—*
Jourquin, Lucien; and Du Prez, Eddie, 4,292,411, Cl. 521-51.000.

Duracell International Inc.: *See—*
Di Palma, Ralph; and Phillips, Arthur, 4,292,383, Cl. 429-219.000.

Duren, Karl, to Mannesmann AG. Seam welding of pipes. 4,292,492, Cl. 219-73.000.

Eagle-Picher Industries, Inc.: *See—*
Erisman, Lester R.; and Brown, Robert A., 4,292,357, Cl. 428-124.000.

Eardley, Edward P.: *See—*
Bergsten, Victor E.; Eardley, Edward P.; and Halvorson, Thomas G., 4,291,634, Cl. 110-235.000.
Bergsten, Victor E.; Eardley, Edward P.; and Fisher, Theodore F., 4,291,636, Cl. 110-346.000.

Easterly, Donald O., to Eastman Kodak Company. Photographic apparatus. 4,291,959, Cl. 354-31.000.

Eastman Kodak Company: *See—*
Adin, Anthony, 4,292,399, Cl. 430-338.000.
DiFrancesco, Alphonse B., 4,291,970, Cl. 355-3.00R.
Easterly, Donald O., 4,291,959, Cl. 354-31.000.
Frank, Lee F.; and Lee, James K., 4,291,958, Cl. 354-25.000.

Eaton Corporation: *See—*
Hammond, Howard A., 4,291,734, Cl. 144-2.00Z.

Ebert, Hermann; Gruntleitner, Johann; and Kuhnlein, Hans, to Siemens Aktiengesellschaft. Reversible direct current motor with a permanent magnet rotor and electronic commutating device. 4,292,573, Cl. 318-138.000.

Ebert, Hermann: *See—*
Kuhnlein, Hans; Gruntleitner, Hans; and Ebert, Hermann, 4,292,575, Cl. 318-254.000.

Eckel, Giselher, to Siemens Aktiengesellschaft. Circuit arrangement for receiving unipolar DC signals. 4,292,466, Cl. 178-3.000.

Edinger, Egon: *See—*
Egger, Walter; Edinger, Egon; and Pedall, Friedrich, 4,292,636, Cl. 343-6.5SS.

Educase Incorporated: *See—*
Fast, John; and Williams, Harvey, 4,291,602, Cl. 83-745.000.

Egger, Walter; Edinger, Egon; and Pedall, Friedrich, to Siemens Aktiengesellschaft. Passive reply device for use in the automatic wireless transmission of multi-place numerical information between active interrogation devices and such passive reply devices, which are movable with respect to one another and method of making the same. 4,292,636, Cl. 343-6.5SS.

Eggler, James F.; and Schaaf, Thomas K., to Pfizer Inc. Sulfonyl prostaglandin carboxamide derivatives. 4,292,444, Cl. 564-97.000.

Egli, Fischer & Co. AG: *See—*
Schenkel, Willi; and Seger, Hans, 4,291,855, Cl. 248-74.00A.

Egorov, Anatoly P.: *See—*
Kolesnik, Mikhail I.; Egorov, Anatoly P.; Kuznetsov, Anatoly A.; Gobov, Anatoly P.; Ryabukhin, Jury M.; Rudakov, Viktor A.; Pisarev, Gennady V.; Zheleznov, Jury M.; and Vasiliev, Alexei V., 4,292,345, Cl. 427-113.000.

Egtvedt, Myron D.: *See—*
Ziemba, Richard T.; Kinzel, Joseph A.; and Egtvedt, Myron D., 4,291,627, Cl. 102-265.000.

Ehrlinger, Friedrich: *See—*
Meyerle, Michael; and Ehrlinger, Friedrich, 4,291,592, Cl. 74-687.000.

Eichenlaub, Rolf; and Novakovic, Boris Z. Cutting wheel. 4,291,667, Cl. 125-15.000.

Eime, Lester O.; and Parker, Edward H., to Western Litho Plate & Supply Co. Method for improving the press life of a lithographic image having an outer layer comprising an epoxy resin and article produced by method. 4,292,396, Cl. 430-302.000.

Eka Aktiebolag: *See—*
Grunewald, Kurt H.; and Mansson, Inge G., 4,292,216, Cl. 260-17.500.

Electric Power Research Institute, Inc.: *See—*
Hingorani, Narain G., 4,292,545, Cl. 307-102.000.

Elikan, Leonard; Stana, Regis R.; and Ritchey, Robert W., to Wyoming Mineral Corp. Purification of wet process phosphoric acid as a pretreatment step in the recovery of uranium. 4,292,278, Cl. 423-8.000.

ELITEX, koncern textilniho strojirenstvi: *See—*
Prohazka, Miloslav; and Kaulich, Karel, 4,291,731, Cl. 139-438.000.

Elliott, Herbert J. Apparatus for solidifying molten material. 4,292,016, Cl. 425-101.000.

Elliott, Margaret L.; and Wright, Mary J. Catalyst and solvent free epoxy materials. 4,292,213, Cl. 260-2.300.

Elmberg, Dwayne R., to Honeywell Inc. Pilot stage valve. 4,291,716, Cl. 137-83.000.

Elwell, Dennis: *See—*
De Mattei, Robert C.; Elwell, Dennis; and Feigelson, Robert S., 4,292,145, Cl. 204-60.000.

Embadac S.A.: *See—*
Bidegain, Georgy, 4,292,102, Cl. 156-213.000.

Embree, Milton L.; Goldthorp, David C.; and Vogelpohl, David R., to Bell Telephone Laboratories, Incorporated. Relaxation oscillator with plural constant current sources. 4,292,604, Cl. 331-111.000.

Emerson Electric Co.: *See—*
Brent, Richard W., 4,292,503, Cl. 219-535.000.
Schnyder, William J., 4,291,455, Cl. 29-596.000.

Emhart Industries, Inc.: *See—*
Deane, Kenneth E., 4,291,576, Cl. 73-352.000.
Smock, Steven W.; and Adams, George W., 4,292,482, Cl. 200-38.00R.

Emmons, Donald O.: *See—*
Charchian, Loris J.; Emmons, Donald O.; and Zlotek, Thaddeus F., 4,291,795, Cl. 192-113.00B.

Energy Recycling Company: *See—*
Clyne, Arthur J.; Knarr, John E.; and Miller, Stanley, 4,291,750, Cl. 165-34.000.

Energy Research Corporation: *See—*
Klein, Martin G., 4,292,381, Cl. 429-120.000.

Engdahl, Gerald E.; and Maher, James B., to Chicago Bridge & Iron Company. Fluidized bed crystallization apparatus and method. 4,291,550, Cl. 62-544.000.

Engel, Joseph C., to Westinghouse Electric Corp. Energy-conserving illumination system. 4,292,570, Cl. 315-360.000.

Engelhardt, Gunther: *See—*
Tauber, Oswald; Engelhardt, Gunther; Leitold, Matyas; and Schmidt, Gunther, 4,292,319, Cl. 424-250.000.

Engelsberger, Georg: *See—*
Lindner, Tassilo; Engelsberger, Georg; Zeller, Norbert; and Riedle, Rudolf, 4,292,434, Cl. 556-479.000.

Engler, Louis C. Levee disc apparatus. 4,291,770, Cl. 172-185.000.

Engmann, Gunther; Lepach, Werner; and Speyerer, Heinz, to Maschinenfabrik Niehoff KG. Apparatus for coiling wire. 4,292,114, Cl. 156-447.000.

Enomoto, Ryo; Yoshioka, Mitihiro; and Yokoyama, Takao, to Ibigawa Electric Industry Co., Ltd. Apparatus for producing silicon carbide. 4,292,276, Cl. 422-199.000.

Ensmann, Burt W.; Kuriloff, Fredric M.; and Rosenhagen, William, to Ideal Toy Corporation. Toy vehicle engine sound device. 4,291,877, Cl. 273-86.00B.
Enso-Gutzeit Osakeytio : *See*—
Lintunen, Tuomo; and Kohonen, Raimo, 4,292,123, Cl. 162-60.000.
Entwistle Company, The: *See*—
Allard, Joseph R., 4,291,527, Cl. 57-58.840.
ERCO Industries Limited: *See*—
Forster, James H., 4,292,275, Cl. 422-198.000.
Erdmann, Jurgen; and von Stein, Walter, to Erwin Sick GmbH Optik-Elektronik. Adjustment device for aligning a group of cyclically switched light transmitters or receivers with a single light receiver or transmitter. 4,291,977, Cl. 356-152.000.
Erickson, Charles W.: *See*—
Probyn, Keith A.; Nolen, Richard W.; Erickson, Charles W.; Dawson, Gerald G.; Goldstein, Ralph; and Bender, Max, 4,292,034, Cl. 493-92.000.
Erickson, John W., to Kobe, Inc. Turbo pump gas compressor. 4,292,011, Cl. 417-53.000.
Eriksson, Olle, to Ab Asea Atom. Biological shield for insulating pressure vessels. 4,292,134, Cl. 176-38.000.
Erisman, Lester R.; and Brown, Robert A., to Eagle-Picher Industries, Inc. Zinc/zinc oxide laminated anode assembly. 4,292,357, Cl. 428-124.000.
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Schulte, Klaus; and Ersfeld, Heinrich, 4,291,991, Cl. 366-159.000.
Ershov, Geny S.: *See*—
Anfilov, Igor V.; Ershov, Geny S.; Kaidoshko, Eduard A.; Remizov, Jury B.; Rozhenko, Anatoly L.; Suvorov, Gennady P.; and Scherbatenko, Boris G., 4,291,971, Cl. 355-14.00R.
Erwin Sick GmbH Optik-Elektronik: *See*—
Erdmann, Jurgen; and von Stein, Walter, 4,291,977, Cl. 356-152.000.
Sick, Erwin; and Mankel, Siegfried, 4,291,987, Cl. 356-431.000.
Escher Wyss Aktiengesellschaft: *See*—
Marchioro, Ignazio, 4,291,446, Cl. 29-116.0AD.
Escher Wyss Limited: *See*—
Marchioro, Ignazio, 4,291,447, Cl. 29-116.0AD.
Eswaran, Kapali P.; Hamacher, Vincent C.; and Shedler, Gerald St., to International Business Machines Corporation. Port logic for a communication bus system. 4,292,623, Cl. 340-147.00R.
Ethyl Corporation: *See*—
Rifkin, Ellis B., 4,292,139, Cl. 203-6.000.
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European Atomic Energy Community (EURATOM): *See*—
Luchtmans, Fernand; Jehenson, Pierre; and Pisoni, Angelo, 4,292,521, Cl. 250-323.000.
Euteco Impianti S.p.A.: *See*—
Piccolo, Luigi; Corsini, Tullio; Paolinelli, Antonio; Ferri, Gaudenzio; and La Rovere, Angelo, 4,292,085, Cl. 106-109.000.
Evans, James D.; and Pool, Sam L., to Hydac, Inc. Digital altimeter computer. 4,292,671, Cl. 364-433.000.
Evans, Robert F. Strictive material deflectable collar for use in borehole angle control. 4,291,773, Cl. 175-61.000.
Ewertowski, Norbert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Pallet changer for a manufacture plant. 4,291,797, Cl. 198-472.000.
Ex-Cell-O Corporation: *See*—
Fitzpatrick, Paul; and Gavasso, Richard J., 4,291,504, Cl. 51-165.880.
Excelsior Fitness Equipment Co.: *See*—
Brilando, Frank P.; and Szymski, Eugene J., 4,291,872, Cl. 272-73.000.
Exxon Research & Engineering Co.: *See*—
Brois, Stanley J.; and Gutierrez, Antonio, 4,292,184, Cl. 252-46.300.
Gladrow, Elroy M., 4,292,169, Cl. 208-120.000.
Gladrow, Elroy M., 4,292,288, Cl. 423-247.000.
Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., 4,292,181, Cl. 210-638.000.
Malatesta, Alberto, 4,292,221, Cl. 260-23.70C.
Mauldin, Charles H.; and Baird, William C., Jr., 4,292,204, Cl. 252-439.000.
Mayer, Francis X.; and Arey, William F., Jr., 4,292,171, Cl. 208-164.000.
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., 4,292,286, Cl. 423-223.000.
Wesselhoft, Robert D.; and Ryan, Daniel F., 4,292,048, Cl. 48-197.00R.
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Mann, Egon; and Eymuller, Helmut, 4,291,779, Cl. 180-305.000.
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Weidt, Karl A., 4,291,804, Cl. 206-509.000.
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Selander, Lennart; Fahlen, Lars; and Sipek, Ladislav, 4,292,493, Cl. 219-74.000.
Faitani, Joseph J.; Austin, George W.; Chase, Terry J.; Suljak, George T.; and Misage, Robert J., to United Technologies Corporation. Catalytic reactor with improved burner. 4,292,274, Cl. 422-197.000.
Farber, Milton; and Mariotti, Nancy S., to Uniroyal, Inc. Iodine treated elastomeric article. 4,292,150, Cl. 204-159.120.
Faria, Carl R., to Thermionics Laboratory, Inc. Gate valve with slideable closure expandable upon oscillation. 4,291,861, Cl. 251-158.000.
Farnam Companies, Inc.: *See*—
Lindley, Donald C., 4,291,486, Cl. 43-61.000.
Farris, Clyde A.; and Farris, Clyde A., Jr. Method and apparatus for controlling dissolved solid concentrations. 4,292,039, Cl. 23-230.00A.
Farris, Clyde A., Jr.: *See*—
Farris, Clyde A.; and Farris, Clyde A., Jr., 4,292,039, Cl. 23-230.00A.
Fast, John; and Williams, Harvey, to Educase Incorporated. Panel cutting device. 4,291,602, Cl. 83-745.000.
Faunce, Frank R. Dentifrice with topical and systemic phosphate fluoride system. 4,292,306, Cl. 424-52.000.
Faust, Karl-Volker, to Paul Hettich & Co. Guiding reciprocable drawers of pieces of furniture or the like. 4,291,929, Cl. 312-341.00R.
Feder, Alvin, to Motorola, Inc. Mounting arrangement for crystal assembly. 4,292,562, Cl. 310-348.000.
Feigelson, Robert S.: *See*—
De Mattei, Robert C.; Elwell, Dennis; and Feigelson, Robert S., 4,292,145, Cl. 204-60.000.
Feldman, Michel; and Le Goff epouse Henaff, Jeannine. Recursive filter for transfer of charge deposits. 4,292,609, Cl. 333-165.000.
Feng, C. T. Indexed book. 4,291,900, Cl. 281-15.00R.
Ferranti Limited: *See*—
Longmuir, Donald A.; and Morrison, John M., 4,292,586, Cl. 324-73.00R.
Ferri, Gaudenzio: *See*—
Piccolo, Luigi; Corsini, Tullio; Paolinelli, Antonio; Ferri, Gaudenzio; and La Rovere, Angelo, 4,292,085, Cl. 106-109.000.
Feuerbaum, Hans P., to Siemens Aktiengesellschaft. Device for contact-free potential measurements. 4,292,519, Cl. 250-310.000.
Fiat-Allis Construction Machinery, Inc.: *See*—
Highland, Edward, 4,291,589, Cl. 74-526.000.
Koch, Otto E., 4,291,896, Cl. 280-775.000.
Fiat Veicoli Industriali S.p.A.: *See*—
Formia, Antonio; and Filtri, Giorgio, 4,291,650, Cl. 123-41.82A.
Fields, Robert E. Connector for tubing. 4,291,903, Cl. 285-39.000.
Figlhuber, Dietgar; Gallwas, Johannes; Weber, Robert; and Weber, Jakob, to Kraftwerk Union Aktiengesellschaft. Inspection device. 4,291,579, Cl. 73-636.000.
Filtri, Giorgio: *See*—
Formia, Antonio; and Filtri, Giorgio, 4,291,650, Cl. 123-41.82A.
Finn, Bernard J.; and Haddlesey, Brian T., to General Motors Corporation. Restraint belt positioner. 4,291,898, Cl. 280-804.000.
Finn, Bernard J.; Haddlesey, Brian T.; and Reid, Kenneth H., to General Motors Corporation. Buckle assembly for continuous loop occupant restraint belt system. 4,291,918, Cl. 297-483.000.
Firstov, Vladislav D.: *See*—
Sanin, Sergei A.; Ponomarenko, Jury F.; Firstov, Vladislav D.; Khorin, Vladimir N.; Ragutsky, Arnold M.; Kostjunin, Boris N.; and Bronfen, Petr M., 4,291,718, Cl. 137-87.000.
Fisch, Nathaniel J., to Massachusetts Institute of Technology. System and method for generating steady state confining current for a toroidal plasma fusion reactor. 4,292,124, Cl. 176-3.000.
Fisher, Richard L.; Wright, David J.; and Scheel, Randall, to Teledyne Industries, Inc. Scraper assembly for use with a fluidized bed condenser. 4,291,753, Cl. 165-94.000.
Fisher, Theodore F.: *See*—
Bergsten, Victor E.; Eardley, Edward P.; and Fisher, Theodore F., 4,291,636, Cl. 110-346.000.
Fisons Limited: *See*—
van Hoogstraten, Samuel D.; and Davies, David H. K., 4,292,068, Cl. 71-88.000.
Fitzpatrick, Paul; and Gavasso, Richard J., to Ex-Cell-O Corporation. Method and apparatus for in-process gaging of tool elements. 4,291,504, Cl. 51-165.880.
Flex Kleen Corp.: *See*—
Ulvestad, Edward A.; and Harris, Charles M., 4,292,057, Cl. 55-302.000.
Flick, Carl; and Ying, Sui-Chun, to Westinghouse Electric Corp. Support structure for dynamoelectric machine stators spiral pancake winding. 4,292,558, Cl. 310-194.000.
Flinn, Robert W., to American Greetings Corporation. Apparatus and method for installing wicking in candles. 4,291,458, Cl. 29-650.000.
Folland Corporation: *See*—
Folland, Roy E., 4,291,720, Cl. 137-209.000.
Folland, Roy E., to Folland Corporation. Pressure controlled receiver for storing emulsion. 4,291,720, Cl. 137-209.000.
Follett, Earl C., to Measurematic Development Company. Mechanical point locator. 4,291,468, Cl. 33-192.000.
Forbes, Brian K.: *See*—
Catiller, Robert D.; and Forbes, Brian K., 4,292,667, Cl. 364-200.000.
Ford Motor Company: *See*—
Rhodes, Eugene E., 4,291,450, Cl. 29-157.30R.
Theodore, Ares N.; Pett, Robert A.; and Qaderi, S. Burhan A., 4,292,223, Cl. 260-29.1SB.
Theodore, Ares N., 4,292,224, Cl. 260-29.1SB.
Theodore, Ares N.; and Lemieux, Marvin A., 4,292,225, Cl. 260-29.1SB.
Trzoska, Peter R., 4,291,652, Cl. 123-90.570.

Formia, Antonio; and Filtri, Giorgio, to Fiat Veicoli Industriali S.p.A. Cylinder head for compression-ignition internal combustion engine. 4,291,650, Cl. 123-41.82A.

Forster, James H., to ERCO Industries Limited. Modular chlorine dioxide generation systems. 4,292,275, Cl. 422-198.000.

Forster, Rolf, to Bernhard Forster GmbH. Orthodontic device for rotating a tooth. 4,292,025, Cl. 433-18.000.

Fort, Pierre H., to Pont-a-Mousson S.A. Machine for extracting centrifuged pipe. 4,291,630, Cl. 104-173.00R.

Foster, Elgin J.: *See—*
Johnson, Dannis R.; Foster, Elgin J.; and Soukup, Richard J., 4,292,661, Cl. 361-393.000.

Fowler, James M.: *See—*
Alvarez, Patricio D.; Fowler, James M.; and Moran, George A., 4,291,862, Cl. 257-167.000.

Fox, Robert M.; Mogk, Robert D.; and Priebe, Edward T., to General Motors Corporation. Wind deflector for sun roof. 4,291,912, Cl. 296-217.000.

Franchina, Anthonino A., to Wojcik, Karl, a part interest. Heating system with focused solar panels and heat pump assist. 4,291,833, Cl. 237-2.00B.

Francis, Colin G.: *See—*
Ozin, Geoffrey A.; Francis, Colin G.; and Huber, Helmut X., 4,292,253, Cl. 260-429.500.

Frank, Lee F.; and Lee, James K., to Eastman Kodak Company. Camera with electronic flash and piezoelectric lens motor. 4,291,958, Cl. 354-25.000.

Frank, Willi, to Hauni-Werke Korber & Co. KG. Device for heating the seams of wrappers for rod-like fillers in cigarette making machines or the like. 4,291,713, Cl. 131-68.000.

Franklin Electric Co., Inc.: *See—*
Schaefer, Edward J., 4,292,555, Cl. 310-68.00R.

Franks, Larry A.; Lutz, Stephen S.; and Lyons, Peter B., to United States of America, Energy. Radiation detection system. 4,292,527, Cl. 250-483.000.

Franks, Larry A.: *See—*
Davies, Terence J.; Franks, Larry A.; and Nelson, Melvin A., 4,292,537, Cl. 250-361.00R.

Frauenrath, Herbert: *See—*
Scharf, Hans-Dieter; and Frauenrath, Herbert, 4,292,246, Cl. 260-347.400.

Fray, Derek J.; and Thomas, Bernard K., to National Research Development Corporation. Zinc chloride electrolysis. 4,292,147, Cl. 204-118.000.

Frederick Electronics Corporation: *See—*
Wilson, John F.; Hoover, Edward D.; Hammond, Philip K.; Moshier, William A.; Woodell, Jack L.; Spaniol, John W.; Bowerman, John J.; Bieber, Larry C.; and Perlman, Marvin, 4,292,465, Cl. 178-3.000.

Freeman, James D.; and Freeman, Robert L. Track-mounted pull-down luggage-carrier for automobiles. 4,291,823, Cl. 224-310.000.

Freeman, Peter A.: *See—*
Thompson, Worthington J.; and Freeman, Peter A., 4,292,540, Cl. 290-55.000.

Freeman, Robert L.: *See—*
Freeman, James D.; and Freeman, Robert L., 4,291,823, Cl. 224-310.000.

Frei, Ephraim H.; and Sollish, Bruce D., to Yeda Research & Development Co. Ltd. Apparatus and method for detection of tumors in tissue. 4,291,708, Cl. 128-734.000.

Friese, Karl-Hermann: *See—*
Muller, Klaus; Maurer, Helmut; Dietz, Hermann; Friese, Karl-Hermann; Leibfried, Wolfgang; Stecher, Gunther; and Linder, Ernst, 4,292,158, Cl. 204-195.00S.

Frissora, Anthony P., to Allied Chemical Corporation. Liquid level monitor. 4,291,575, Cl. 73-302.000.

Fritchle, Cliff D.; Hobrecht, Charles E.; and Scott, Allan W., to Varian Associates, Inc. In-band resonant loss in TWT's. 4,292,567, Cl. 315-3.500.

Fritz Schafer Gesellschaft Mit Beschrankter Haftung: *See—*
Weidt, Karl A., 4,291,804, Cl. 206-509.000.

Frolov, Jury F.; Sukoian, Nariman A.; Proshkin, Ivan T.; and Basalaev, Anany M. Electrode-slipping apparatus for electric furnaces. 4,292,460, Cl. 13-14.000.

Frolow, Jack L. Tennis racket. 4,291,574, Cl. 73-65.000.

Frydman, Samuel: *See—*
Grenga, John; and Frydman, Samuel, 4,291,738, Cl. 160-176.00R.

Fryer, Kevin C.; and Prentice, Edgar C., to Blevex Limited. Heat protective barrier comprising apertured member having intumescent coating. 4,292,358, Cl. 428-135.000.

Fuchs, Hedwig, heir: *See—*
Fuchs, Heinz, deceased; Muller, Hans-Friedrich; and Hecht, Hildegard, 4,291,698, Cl. 128-335.000.

Fuchs, Heinz, deceased (by Fuchs, Hedwig, heir); Muller, Hans-Friedrich; and Hecht, Hildegard, to Intermedicat GmbH. Button for surgical applications. 4,291,698, Cl. 128-335.000.

Fuji Photo Film Co., Ltd.: *See—*
Ikeda, Tomoaki; Sigyoo, Masamiti; Ikeda, Sadaharu; Yoshida, Satoshi; and Tomotsu, Takeshi, 4,292,388, Cl. 430-162.000.
Ikeda, Tomoaki; Shinozaki, Fumiaki; and Nakao, Sho, 4,292,392, Cl. 430-271.000.
Ishiwata, Mamoru; Uematsu, Shinji; Ozaki, Kazuo; and Ishiyama, Masashi, 4,292,349, Cl. 427-335.000.
Itoh, Isamu; Hashimura, Taiji; and Ishikawa, Takatoshi, 4,292,401, Cl. 430-393.000.
Katoh, Kazunobu; and Makino, Teruyoshi, 4,292,390, Cl. 430-207.000.
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,292,272, Cl. 422-57.000.
Wada, Minoru; Shinozaki, Fumiaki; Takahashi, Yohnosuke; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,292,393, Cl. 430-275.000.
Wada, Minoru; Shinozaki, Fumiaki; Takahashi, Yohnosuke; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,292,395, Cl. 430-299.000.

Fujii, Hitoshi: *See—*
Takeuchi, Satoshi; Akada, Masanori; Fujii, Hitoshi; Toida, Takashi; Takamizawa, Minoru; and Inoue, Yoshio, 4,292,397, Cl. 430-303.000.

Fujii, Masao; Ogawa, Yoshifusa; and Morihiro, Yoshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Preparation of boiling heat transfer surface. 4,291,758, Cl. 165-133.000.

Fujii, Toru: *See—*
Takase, Hiroshi; and Fujii, Toru, 4,291,952, Cl. 350-471.000.

Fujimura, Kensuke; Yamamoto, Naomichi; Ogawa, Masahiro; and Tanigawa, Nobuyoshi, to Ube Industries, Ltd. Method of dispersing a liquid into another liquid. 4,291,549, Cl. 62-534.000.

Fujioka, Masahiko, to Tokyo Shibaura Electric Co., Ltd. Enclosed-type magnetic disc recording and/or reproducing apparatus. 4,292,656, Cl. 360-97.000.

Fujisawa Pharmaceutical Company, Limited: *See—*
Kishimoto, Teiji; Kochi, Hiromu; and Kaneda, Yoshiyuki, 4,292,320, Cl. 424-258.000.

Fujita, Kenji; Shibata, Yuji; Mikuni, Hisao; and Shibuya, Tsuneo, to Sumitomo Heavy Industries, Ltd. Door lifter for coke oven. 4,292,137, Cl. 202-248.000.

Fujitsu Limited: *See—*
Kudo, Daijiro; and Ikeda, Kiyoshi, 4,292,153, Cl. 204-164.000.

Fujizoki Pharmaceutical Co., Ltd.: *See—*
Kasahara, Yasushi; and Ashihara, Yoshihiro, 4,292,404, Cl. 435-18.000.

Fukuda, Shiro: *See—*
Ida, Yoshiaki; Fukuda, Shiro; and Imamura, Osayoshi, 4,291,989, Cl. 356-440.000.

Fukui, Shiomi: *See—*
Kotani, Teizo; Arai, Kozo; Fukui, Shiomi; and Nagata, Masaki, 4,292,261, Cl. 264-24.000.

Fulkerson, Earl. Apparatus for wires in the ground. 4,291,780, Cl. 181-121.000.

Fuller, Paul. Character reader. 4,292,621, Cl. 340-146.30H.

Fullerton, W. Wardle, to Merck & Co., Inc. Surfactant assay. 4,292,041, Cl. 23-230.300.

Fulton, Cyrus B., Jr. Machine degradable reinforced paper barrier material. 4,292,366, Cl. 428-293.000.

Fumakilla Limited: *See—*
Muramoto, Takayoshi; and Orita, Kunitaka, 4,292,322, Cl. 424-274.000.

Furuhata, Takashi: *See—*
Yumde, Yasufumi; and Furuhata, Takashi, 4,292,652, Cl. 358-138.000.

Furukawa, Yosio: *See—*
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; and Furukawa, Yosio, 4,291,926, Cl. 308-73.000.

Furuta, Kenzi: *See—*
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,292,509, Cl. 235-92.0MP.

Fuwa, Yoshio: *See—*
Komiyama, Yoshiro; Kondo, Katsumi; Fuwa, Yoshio; Matsui, Akira; Miyazaki, Shoji; and Hasegawa, Tokushiro, 4,292,074, Cl. 75-122.000.

G. Siempelkamp GmbH & Co.: *See—*
Breiding, Hans-Joachin; and Bachen, Manfred, 4,291,569, Cl. 72-403.000.

Gabbay, Emile; Tran Quang, Dang; and Lafitte, Andre, to Compagnie Generale de Radiologie. Multiple cathode X-ray tube for densitometers. 4,292,563, Cl. 313-56.000.

Gabler, Otto L.: *See—*
Buck, Gordon H.; Gabler, Otto L.; Kilroy, Eugene J.; and Leoncavallo, Richard, 4,291,663, Cl. 124-26.000.

Gabriel, Hans R. L.; Post, Larry K.; Culbertson, Billy M.; and Graham, Curtis M., to Ashland Oil, Inc. Pressure sensitive adhesion compositions. 4,292,231, Cl. 260-33.4UR.

Gachot, Jean. Antifriction device for a valve control shaft. 4,291,863, Cl. 251-214.000.

Gaffney, Michael F.: *See—*
Shaffer, Peter T. B.; and Gaffney, Michael F., 4,292,528, Cl. 250-506.000.

Gagnebin, Gustave, to Hermes Precisa International S.A. Device for installing and securing a printing disc. 4,291,993, Cl. 400-144.200.

Galafassi, Pierre; Adam, Jean-Marie; Loew, Peter; and Scheidegger, Hans, to Ciba-Geigy Corporation. Process for dyeing cellulose-containing fibre materials. 4,292,037, Cl. 8-554.000.

Gallmeyer, William W. Air dam apparatus for a motor vehicle. 4,291,911, Cl. 296-78.00R.

Gallwas, Johannes: *See—*
Figlhuber, Dietgar; Gallwas, Johannes; Weber, Robert; and Weber, Jakob, 4,291,579, Cl. 73-636.000.

Garner, Edward D. Dressing tool for grinding wheels. 4,291,666, Cl. 125-11.0TP.

Garrett Corporation, The: *See—*
Morse, Calvin J.; and Kossuth, Gabor, 4,291,754, Cl. 165-165.000.

Garrett, Ernest R. Lid piercing device. 4,291,464, Cl. 30-363.000.

Garvin, Gregory A. Livestock feeder. 4,291,648, Cl. 119-61.000.

Gasperini, Eugene. Photographic exposure chamber. 4,292,662, Cl. 362-17.000.

Gates, Donald C., to Alloway Manufacturing Inc. Method of defoliating. 4,291,524, Cl. 56-121.430.

Gavasso, Richard J.: *See—*
Fitzpatrick, Paul; and Gavasso, Richard J., 4,291,504, Cl. 51-165.880.

Gebarowski, Peter D.; and Henry, Sam W., to Tutco, Inc. Expanded metal electric heating element with edge support. 4,292,504, Cl. 219-542.000.

Gebhardt, Elfriede. Retarding conveyor for cargo. 4,291,796, Cl. 198-460.000.

Geddes, Leslie A.; Bourland, Joe D.; and Terry, Reese S., to CTS Corporation. Method of and apparatus for automatically detecting and treating ventricular fibrillation. 4,291,699, Cl. 178-419.00D.

Gelman Sciences, Inc.: *See—*
Ambler, Jeffrey, 4,292,154, Cl. 204-180.00G.
Ambler, Jeffrey, 4,292,162, Cl. 204-299.00R.

Gemignani, Francois. Apparatus for pressure detection and control of a safety valve. 4,291,721, Cl. 137-492.000.

General Dynamics Corporation: *See—*
Weiss, Olin E.; Davis, Grant L.; Hudson, James L.; and Dowell, Harlan T., 4,292,108, Cl. 156-259.000.

General Electric Company: *See—*
Bower, Arnold B., Jr., 4,291,799, Cl. 206-219.000.
Buzzell, Colby E.; and Allen, Malcolm H., Jr., 4,291,582, Cl. 73-861.350.
Chu, Hing C.; and Sun, Y. S. Edmund, 4,292,644, Cl. 357-21.000.
Gigliotti, Michael F. X.; Jackson, Melvin R.; Henry, Michael F.; Woodford, David A.; Yang, Sherwin S.; and Bruch, Charles A., 4,292,076, Cl. 75-170.000.
Howell, E. Keith, 4,292,612, Cl. 335-14.000.
Laskaris, Evangelos T., 4,291,997, Cl. 403-24.000.
McCarty, Lewis V.; and Pugh, John W., 4,291,444, Cl. 29-25.140.
Williamson, Dennis F., 4,292,531, Cl. 290-14.000.
Ziemba, Richard T.; Kinzel, Joseph A.; and Egtvedt, Myron D., 4,291,627, Cl. 102-265.000.

General Motors Corporation: *See—*
Baldwin, Bryce R.; Brady, Laurence M.; and Holcomb, Warren N., 4,292,000, Cl. 403-320.000.
Buetemeister, Earl H., 4,291,586, Cl. 74-335.000.
Day, Edward G., 4,291,612, Cl. 91-6.000.
Finn, Bernard J.; and Haddlesey, Brian T., 4,291,898, Cl. 280-804.000.
Finn, Bernard J.; Haddlesey, Brian T.; and Reid, Kenneth H., 4,291,918, Cl. 297-483.000.
Fox, Robert M.; Mogk, Robert D.; and Priebe, Edward T., 4,291,912, Cl. 296-217.000.
Livesay, J. D., 4,291,548, Cl. 62-503.000.
Staub, Vincent M., Jr., 4,291,790, Cl. 192-3.280.

General Signal Corporation: *See—*
Bogenschutz, Thomas M.; and Bohusch, Glen O., 4,291,789, Cl. 188-351.000.

Genieys, Emile J.: *See—*
Lepetit, Pierre J.; and Genieys, Emile J., 4,292,144, Cl. 204-23.000.

Georgevich, Stephen. Cleaning and application device for medical purposes. 4,291,697, Cl. 128-269.000.

Georgia-Pacific Corporation: *See—*
Sorensen, James R., 4,291,830, Cl. 229-45.00R.

Gerard, Guy. Plasma matrix display unit. 4,292,631, Cl. 340-771.000.

Gerber, Howard L., to Continental Group, Inc., The. Tab heating and applying apparatus. 4,292,489, Cl. 219-10.710.

Gerritsen, Leendert A.; and Scholten, Joseph J. F., to Stamicarbon, B.V. Heterogeneous catalyst on the basis of an organometallic complex. 4,292,198, Cl. 252-428.000.

Gerry, Martin E. Inductive-capacitive modulated ignition system. 4,291,661, Cl. 123-606.000.

Gerry, Martin E. High energy modulation ignition system. 4,292,569, Cl. 315-209.00R.

Gerstenmaier, Jurgen: *See—*
Leiber, Heinz; and Gerstenmaier, Jurgen, 4,291,924, Cl. 303-111.000.

Gheen, Lyndle G. Automatic multiple move irrigation line. 4,291,837, Cl. 239-70.000.

Ghinazzi, Daniel J.: *See—*
Barels, Ronald R.; and Ghinazzi, Daniel J., 4,292,304, Cl. 424-37.000.

Giallorenzi, Thomas G.; and Steinberg, Richard A., to United States of America, Navy. Polarization-independent optical switches/modulators. 4,291,939, Cl. 350-96.140.

Gibbs, Charles G.: *See—*
Rutter, Jerry L.; Gibbs, Charles G.; and Hedrich, Loren W., 4,292,069, Cl. 71-94.000.

Gigliotti, Michael F. X.; Jackson, Melvin R.; Henry, Michael F.; Woodford, David A.; Yang, Sherwin S.; and Bruch, Charles A., to General Electric Company. Transverse ductile fiber reinforced eutectic nickel-base superalloys. 4,292,076, Cl. 75-170.000.

Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Positive nail angling device for metal connectors. 4,291,996, Cl. 403-14.000.

Gilbert, James C. Winch means. 4,291,847, Cl. 242-95.000.

Gilchrist, Ralph E.; Hover, George W.; and Barber, Robert M., to Mitchell Energy Corporation. Water flooding process using multiple fluids. 4,291,765, Cl. 166-273.000.

Giles, Barry R. Clamping apparatus for work table. 4,291,868, Cl. 269-93.000.

Gilleland, Randall C.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,292,490, Cl. 219-69.00P.

Gillen, John D.: *See—*
Hill, Stephen R.; De Pinto, Victor M.; and Gillen, John D., 4,292,475, Cl. 179-99.00A.

Gillette Company, The: *See—*
Nowak, Herman P., 4,291,641, Cl. 118-408.000.

Ginn, Le Roy D.; Ginn, Le Royce S.; Morris, John C.; and Travaglio, Dalny, to Universal Pneumatic Controls, Inc. System powered reset velocity controller. 4,291,832, Cl. 236-49.000.

Ginn, Le Royce S.: *See—*
Ginn, Le Roy D.; Ginn, Le Royce S.; Morris, John C.; and Travaglio, Dalny, 4,291,832, Cl. 236-49.000.

Giordano, Vincent; and Senor, Charles, to International Folding Paper Box Co., Inc. Folding box. 4,291,807, Cl. 206-626.000.

Girard, Edmond, to Messier S.A. Apparatus enabling the storage of radioactive wastes and the recovery of the extraneous heat emitted thereby, and a storage element for incorporation in such apparatus. 4,291,536, Cl. 60-644.000.

Gittins, Marvin W., Sr. Safety gate latch system. 4,291,908, Cl. 292-299.000.

Gladrow, Elroy M., to Exxon Research & Engineering Co. Hydrocarbon conversion with zeolite catalyst in metals-absorbing matrix. 4,292,169, Cl. 208-120.000.

Gladrow, Elroy M., to Exxon Research & Engineering Co. Catalyst for CO removal from flue gas. 4,292,288, Cl. 423-247.000.

Glaenzer Spicer: *See—*
Orain, Michel A., 4,291,552, Cl. 64-21.000.

Glanz, Richard, to Baldwin-Korthe Web Controls, Inc. Web guiding system. 4,291,825, Cl. 226-18.000.

Glass, Howard L., to Rockwell International Corporation. Growth of single-crystal $2PbO.Fe_2O_3$. 4,292,119, Cl. 156-624.000.

Gobov, Anatoly P.: *See—*
Kolesnik, Mikhail I.; Egorov, Anatoly P.; Kuznetsov, Anatoly A.; Gobov, Anatoly P.; Ryabukhin, Jury M.; Rudakov, Viktor A.; Pisarev, Gennady V.; Zheleznov, Jury M.; and Vasiliev, Alexei V., 4,292,345, Cl. 427-113.000.

Goldie, Harry; and Stitzer, Steven N., to Westinghouse Electric Corp. Broadband circuit for microwave S/N enhancers. 4,292,607, Cl. 333-24.100.

Goldstein, Ralph: *See—*
Probyn, Keith A.; Nolen, Richard W.; Erickson, Charles W.; Dawson, Gerald G.; Goldstein, Ralph; and Bender, Max, 4,292,034, Cl. 493-92.000.

Goldthorp, David C.: *See—*
Embree, Milton L.; Goldthorp, David C.; and Vogelpohl, David R., 4,292,604, Cl. 331-111.000.

Goloff, Alexander, to Caterpillar Tractor Co. Method and apparatus avoiding blowdown losses in compound engines. 4,291,535, Cl. 60-602.000.

Goodwin, Perry H., Jr.; and Kotalik, Richard J., to Robertshaw Controls Company. Two-wire isolated signal transmitter. 4,292,633, Cl. 340-870.390.

Gordon, Harry W.; and Schaffner, Carl P. Method of treating hypercholesterolemia with n-acyl amphotericin B. 4,292,310, Cl. 424-122.000.

Gordon, Richard; and Ciallella, John G., to Consolidated Refining Co., Inc. Ceramic lid assembly for hermetic sealing of a semiconductor chip. 4,291,815, Cl. 220-200.000.

Gore, Donald B.; Krigbaum, Ronald S.; and Peterson, James O., to Plaskon Products, Inc. Amino molding compound for cold manifold injection molding. 4,292,215, Cl. 260-17.300.

Gorring, Robert L.; and La Pierre, Rene B., to Mobil Oil Corporation. Catalytic process for manufacture of lubricating oils. 4,292,166, Cl. 208-59.000.

Goto, Hiromi; and Ojima, Kenji, to Aisin Seiki Kabushiki Kaisha. Free wheel hub mechanism. 4,291,791, Cl. 192-67.00R.

Gould Inc.: *See—*
Cole, James E.; and Thornton, Peter, 4,291,702, Cl. 128-675.000.

Grabmaier, Josef: *See—*
Plaettner, Rolf; Kruehler, Wolfgang; and Grabmaier, Josef, 4,292,343, Cl. 427-39.000.

Graham, Curtis M.: *See—*
Gabriel, Hans R. L.; Post, Larry K.; Culbertson, Billy M.; and Graham, Curtis M., 4,292,231, Cl. 260-33.4UR.

Gramelt, Stefan: *See—*
Noack, Rolf; and Gramelt, Stefan, 4,292,054, Cl. 55-181.000.

Grasselli, Robert K.: *See—*
Bartek, Joseph P.; Cepulis, Rimoydas L.; and Grasselli, Robert K., 4,292,455, Cl. 585-320.000.

Grassmann, Josef. Electrically heated recording indicator for recording instruments and the like. 4,292,641, Cl. 346-76.00R.

Gray, Frederick W., to Colgate-Palmolive Company. Activated peroxy compound bleaching compositions and bleaching detergent compositions. 4,292,191, Cl. 252-99.000.

Great Lakes Chemical Corporation: *See—*
Sanders, David C., 4,292,183, Cl. 252-8.55R.

Grede Foundries, Inc.: *See—*
Scheiderer, Willard R., 4,291,745, Cl. 164-394.000.

Green, Lawrence E.: *See—*
Bendoni, Leonard V.; and Green, Lawrence E., 4,291,966, Cl. 354-275.000.

Greer Hydraulics, Incorporated: *See—*
Zahid, Abduz, 4,291,726, Cl. 138-30.000.

Greig, Richard C.: *See—*
Werner, Frank D.; Kleven, Lowell A.; and Greig, Richard C., 4,291,684, Cl. 126-450.000.

Grenga, John; and Frydman, Samuel. Universal support for vertical blinds and the like. 4,291,738, Cl. 160-176.00R.

Griffon, Henri. Method for preparing alloxan stable aqueous solutions and solutions resulting therefrom. 4,292,312, Cl. 424-176.000.

Grigo, Ulrich; Morbitzer, Leo; Arlt, Klaus-Peter; Binsack, Rudolf; and Merten, Josef, to Bayer Aktiengesellschaft. Homogeneous thermoplastic mixtures of propylene-ethylene copolymers and liquid, saturated diorganopolysiloxanes within a certain viscosity range. 4,292,222, Cl. 260-29.1SB.

Grigoriev, Veniamin G.: *See—*
Dudko, Daniil A.; Mozzhukhin, Anatoly A.; Breze, Vladimir V.; Kozlov, Anatoly E.; Grigoriev, Veniamin G.; Sotchenko, Vladimir P.; Maximovich, Boleslav I.; Budzan, Bogdan P.; and Zavodian, Vitaly V., 4,292,486, Cl. 219-9.500.

Grimsby, Emerson A.; and Levasheff, Stanley W., to International Telephone and Telegraph Corporation. Grinding or polishing tool. 4,291,502, Cl. 51-120.000.

Grissman Chemicals Limited: *See—*
Diethelm, Eugen, 4,292,318, Cl. 424-250.000.

Grosjean, William C.; and Hensley, John J., to International Harvester Company. Gas turbine cooling systems. 4,292,008, Cl. 415-115.000.

Gruen, Dieter M.: *See—*
Ron, Moshe; Gruen, Dieter M.; Mendelsohn, Marshall H.; and Sheft, Irving, 4,292,265, Cl. 264-82.000.

Grundy, Brian R., to Westinghouse Electric Corp. Radial cold trap. 4,291,865, Cl. 266-227.000.

Grunewald, Kurt H.; and Mansson, Inge G., to Eka Aktiebolag. Lignin-based glue. 4,292,216, Cl. 260-17.500.

Gruntleitner, Hans: *See—*
Kuhnlein, Hans; Gruntleitner, Hans; and Ebert, Hermann, 4,292,575, Cl. 318-254.000.

Gruntleitner, Johann: *See—*
Ebert, Hermann; Gruntleitner, Johann; and Kuhnlein, Hans, 4,292,573, Cl. 318-138.000.

Grutsch, James F.; and Mallatt, Russell C., to Standard Oil Company (Indiana). Use of activated carbon in waste water treating process. 4,292,176, Cl. 210-616.000.

Gudgel, Howard S., to Drill Tech Equipment, Inc. Apparatus for rapidly attaching an inside blowout preventer sub to a drill pipe. 4,291,762, Cl. 166-85.000.

Gulf Oil Corporation: *See—*
Kirkpatrick, Joel L.; Patel, Natu R.; and Rutter, Jerry L., 4,292,071, Cl. 71-96.000.
Rutter, Jerry L.; Gibbs, Charles G.; and Hedrich, Loren W., 4,292,069, Cl. 71-94.000.

Guly, Grigory A.: *See—*
Korytov, Vladimir A.; Maljushevsky, Pavel P.; Guly, Grigory A.; Shkatov, Alexandr S.; Sladkoshteev, Vladimir T.; Patanin, Ruslan V.; Dorokhov, Vasily I.; Klemeshov, Georgy A.; and Arkulis, Grigory E., 4,291,742, Cl. 164-501.000.

Gurtler, Richard W.: *See—*
Cota, Marlo E.; and Gurtler, Richard W., 4,292,264, Cl. 264-81.000.

Gutierrez, Antonio: *See—*
Brois, Stanley J.; and Gutierrez, Antonio, 4,292,184, Cl. 252-46.300.

Gutmann, Otto: *See—*
Kremer, Hubert; Konigs, Heinz; and Gutmann, Otto, 4,291,730, Cl. 139-65.000.

Gutnov, Ruslanbek B.: *See—*
Medovar, Boris I.; Artamonov, Viktor L.; Kirsanov, Pavel I.; Marchenko, Alexandr M.; Bogachenko, Alexei G.; Pavlov, Leonid V.; Kamensky, Jury M.; Gutnov, Ruslanbek B.; and Platonov, Pavel M., 4,291,744, Cl. 164-509.000.

Guynup, William J. Shake resaw feed system. 4,291,601, Cl. 83-415.000.

Gyi, Ko K.: *See—*
Iwan, Wilfred D.; and Gyi, Ko K., 4,292,657, Cl. 360-98.000.

H. Krantz GmbH & Co., Firma: *See—*
Sodec, Frank, 4,291,615, Cl. 98-40.00C.

h.o.p. ConsuLab Inc.: *See—*
Leroux, Adrien, 4,292,532, Cl. 290-6.000.

Haake, Hinrich, to Klockner-Humboldt-Deutz AG-Zweigniederlassurg FAHR. Husk separator for corn harvester. 4,291,521, Cl. 56-13.500.

Habeger, Charles C.: *See—*
Baum, Gary A.; and Habeger, Charles C., 4,291,577, Cl. 73-597.000.

Haddlesey, Brian T.: *See—*
Finn, Bernard J.; and Haddlesey, Brian T., 4,291,898, Cl. 280-804.000.
Finn, Bernard J.; Haddlesey, Brian T.; and Reid, Kenneth H., 4,291,918, Cl. 297-483.000.

Hagelaars, Adrianus M. P. M.: *See—*
Davies, David R.; Zuiderwijk, Jacobus J. M.; and Hagelaars, Adrianus M. P. M., 4,291,766, Cl. 166-276.000.

Halbergerhutte GmbH: *See—*
Wolfsgruber, Friedrich; Kasel, Hans W.; Odendahl, Manfred H. A.; and Morsdorf, Wolfram W., 4,292,075, Cl. 75-130.00R.

Hall, Emmitt D., Jr. Method for stabilizing and hanging surface casing. 4,291,767, Cl. 166-290.000.

Hall, Robert N.: *See—*
Cannon, Curtis W.; and Hall, Robert N., 4,292,289, Cl. 423-301.000.

Hallen Company: *See—*
Allen, Herbert, 4,291,597, Cl. 81-3.480.

Halliburton Company: *See—*
Knox, Lloyd C., 4,292,004, Cl. 405-203.000.

Halsted, Raymond T.: *See—*
Raab, Andrew F.; and Halsted, Raymond T., 4,291,725, Cl. 137-625.250.

Halvorson, Thomas G.: *See—*
Bergsten, Victor E.; Eardley, Edward P.; and Halvorson, Thomas G., 4,291,634, Cl. 110-235.000.

Hamacher, Vincent C.: *See—*
Eswaran, Kapali P.; Hamacher, Vincent C.; and Shedler, Gerald St., 4,292,623, Cl. 340-147.00R.

Hamm, Thomas: *See—*
Regnault, Alain; Sachetto, Jean-Pierre; Tournier, Herve; Hamm, Thomas; and Armanet, Jean-Michel, 4,292,089, Cl. 127-1.000.

Hammond, Howard A., to Eaton Corporation. Tree processing apparatus. 4,291,734, Cl. 144-2.00Z.

Hammond, Philip K.: *See—*
Wilson, John F.; Hoover, Edward D.; Hammond, Philip K.; Moshier, William A.; Woodell, Jack L.; Spaniol, John W.; Bowerman, John J.; Bieber, Larry C.; and Perlman, Marvin, 4,292,465, Cl. 178-3.000.

Hanak, Joseph J., to RCA Corporation. Laser processing technique for fabricating series-connected and tandem junction series-connected solar cells into a solar battery. 4,292,092, Cl. 148-1.500.

Hanna Mining Company, The: *See—*
Chilcote, Dennis D.; and Kaczyski, Donald J., 4,292,281, Cl. 423-27.000.

Hannah, Richard E.; and Lyons, Steffen, to Baxter Travenol Laboratories, Inc. Method and apparatus for making coude catheters. 4,292,270, Cl. 264-320.000.

Hanrahan, James R.; and Levine, Richard G., to Zimmer USA, Inc. Method of producing a foamed polyurethane body-protecting pad. 4,292,263, Cl. 264-46.900.

Hansen, Robert N., to Campbell, William M.; Campbell, Norma J.; Bogdan, Wesley; Clements, Robert; Krone, William; Krone, Keith; Kovacic, Thomas; Stickel, Arloa; and Aurea, Walter C. Coupling guard. 4,291,893, Cl. 280-507.000.

Hansen, Val. Knife guide device for opening of milk and soft drink paper cartons. 4,291,461, Cl. 30-2.000.

Hansson, Anders: *See—*
Odlen, Lars; and Hansson, Anders, 4,292,467, Cl. 179-1.00D.

Hara, Akira: *See—*
Yokoyama, Toshiaki; Hara, Akira; and Okuyama, Takeshi, 4,292,533, Cl. 290-40.00B.

Hard, Robert A.: *See—*
Lingane, Peter J.; Redman, Michael J.; Park, Won C.; Hard, Robert A.; and Harvey, Walter W., 4,291,920, Cl. 299-4.000.

Hardcastle, Phillip, to Cactus Pipe & Supply Co., Inc. Seal for wellheads. 4,291,889, Cl. 277-116.400.

Hardesty, Lee H.: *See—*
Scott, Brian L.; and Hardesty, Lee H., 4,292,469, Cl. 179-1.0SC.

Harding, Claude G., to John Lysaght International Holdings S.A. Structural elements. 4,291,515, Cl. 52-694.000.

Hardy, Thomas A.: *See—*
Walsh, Edward N.; and Hardy, Thomas A., 4,292,036, Cl. 8-182.000.

Harmes, O. Burton; and McGregor, Duane F., to Algona Food Engineering Company. Pallet storage rack attachment. 4,291,812, Cl. 211-207.000.

Harris, Charles M.: *See—*
Ulvestad, Edward A.; and Harris, Charles M., 4,292,057, Cl. 55-302.000.

Harris, David A., to Owens-Corning Fiberglas Corporation. Acoustical panel for suspended ceilings. 4,291,783, Cl. 181-295.000.

Hart, Paul A. H.: *See—*
Appels, Johannes A.; Collet, Marnix G.; Hart, Paul A. H.; and Verhoeven, Johannes F. C. M., 4,292,642, Cl. 357-13.000.

Harth, Robert: *See—*
Pagel, Ernst O.; and Harth, Robert, 4,292,686, Cl. 455-194.000.

Hartley, Kenneth; Moulding, Trevor L. J.; and Rostron, Norman, to United Kingdom Atomic Energy Authority. Nuclear fuel pins. 4,292,127, Cl. 176-17.000.

Hartmann, Franz, to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Method of processing fish. 4,291,435, Cl. 17-45.000.

Harvey, Barrie J., to M. H. Detrick Co., Limited. High temperature enclosures. 4,291,514, Cl. 52-509.000.

Harvey, Walter W.: *See—*
Lingane, Peter J.; Redman, Michael J.; Park, Won C.; Hard, Robert A.; and Harvey, Walter W., 4,291,920, Cl. 299-4.000.

Hasbro Industries, Inc.: *See—*
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Hasegawa Chemical Industry Co., Ltd.: *See—*
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Hasegawa, Paul M.: *See—*
Janick, Jules; Hasegawa, Paul M.; and Pence, Valerie C., 4,291,498, Cl. 47-58.000.

Hasegawa, Shigeji, to Hasegawa Chemical Industry Co., Ltd. FRP Racket frame. 4,291,876, Cl. 273-73.00F.

Hasegawa, Tokushiro: *See—*
Komiyama, Yoshiro; Kondo, Katsumi; Fuwa, Yoshio; Matsui, Akira; Miyazaki, Shoji; and Hasegawa, Tokushiro, 4,292,074, Cl. 75-122.000.

Hashiguchi, Koichi: *See—*
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Hashimoto, Nobuyuki: *See—*
Sakakibara, Naoji; and Hashimoto, Nobuyuki, 4,292,060, Cl. 55-385.00R.

Hashimoto, Yukio: *See*—
Morokawa, Shigeru; Sekiya, Fukuo; Hashimoto, Yukio; Nomura, Yasushi; and Koga, Keiichiro, 4,292,680, Cl. 368-187.000.

Hashimura, Taiji: *See*—
Itoh, Isamu; Hashimura, Taiji; and Ishikawa, Takatoshi, 4,292,401, Cl. 430-393.000.

Haskins, Steve W.: *See*—
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Hattori, Teruo: *See*—
Tanaka, Kentaro; Shoji, Jun'ichi; Kawamura, Yoshimi; Hattori, Teruo; Kondo, Eiji; Matsumoto, Kouichi; Yoshida, Tadashi; and Tsuji, Naoki, 4,292,241, Cl. 260-245.20T.

Hauni-Werke Korber & Co. KG: *See*—
Frank, Willi, 4,291,713, Cl. 131-68.000.

Hawks, Gail B. Low pressure infant seat for normally seating infants with meningomyelocele or other sensitive back deformities. 4,291,917, Cl. 297-452.000.

Hay, Robert A.; and Bergman, Oswald, to Dow Chemical Company, The. Extruded plastic foam shaping apparatus. 4,292,019, Cl. 425-325.000.

Hay, Wayne W., to Airco, Inc. Evacuation manifold for medical anesthesia circuits. 4,291,689, Cl. 128-200.240.

Hayamizu, Yoshisada, to Olympus Optical Co., Ltd. Pentagonal roof prism for viewfinder. 4,291,945, Cl. 350-286.000.

Haynes, Charles E., to ACCO Industries Inc. Method for terminating flexible helical wire conduit. 4,292,267, Cl. 264-157.000.

Hays, James R., Sr.: *See*—
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., 4,292,286, Cl. 423-223.000.

Hechenberger, Dieter A.; and Neye, Angelika, to Lingner + Fischer. Adhesives. 4,292,229, Cl. 260-30.60R.

Hecht, Hildegard: *See*—
Fuchs, Heinz, deceased; Muller, Hans-Friedrich; and Hecht, Hildegard, 4,291,698, Cl. 128-335.000.

Heckrotte, John R., Sr., to Morlock Corporation. Key for driving tamper-proof bolt. 4,291,599, Cl. 81-444.000.

Hedrich, Loren W.: *See*—
Rutter, Jerry L.; Gibbs, Charles G.; and Hedrich, Loren W., 4,292,069, Cl. 71-94.000.

Heidelberger Zement Aktiengesellschaft: *See*—
Wesch, Ludwig; and Meyer, Adolf, 4,292,364, Cl. 428-286.000.

Heilman, Marlin S.; and Langer, Alois A., to Mirowski, Mieczyslaw. Implantable cardiac defibrillating electrode. 4,291,707, Cl. 128-784.000.

Heimbach, Kim P.; and Johnson, Ronald E., to Corning Glass Works. Decalcomania manufacture. 4,292,104, Cl. 156-235.000.

Heiser, Warren R.; and Acey, Eugene A., to Heiser, Warren R. Method and apparatus for folding and crushing empty cylindrical cans. 4,291,618, Cl. 100-35.000.

Heller, Martin G.; Rudder, Joel; and Arasim, Stanley J., Jr., to Heller, Martin G. High speed dispenser for electrical components. 4,291,819, Cl. 221-298.000.

Hemeyer, Arley C. Caliper rule device having extended measurement range. 4,291,465, Cl. 33-143.00M.

Henao, Alvaro, to Borg-Warner Corporation. Clutch assembly with modulated cushion fulcrum. 4,291,792, Cl. 192-89.00B.

Hendrickson, Melvin C., to Zenith Radio Corporation. Stv Subscriber address system. 4,292,650, Cl. 358-123.000.

Hendrix Electronics, Inc.: *See*—
Henrichon, Ernest G., Jr., 4,292,622, Cl. 340-146.3SG.

Henig, Sammy S., to Lockheed Electronics Co., Inc. Refresh cycle minimizer in a dynamic semiconductor memory. 4,292,676, Cl. 365-222.000.

Henkel Corporation: *See*—
Melby, Allan L., 4,292,212, Cl. 252-547.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Scheuffgen, Ingeborg; and Ploog, Uwe, 4,292,088, Cl. 106-268.000.

Henker, Erich: *See*—
Berthold, Gert; Dreyhaupt, Dieter; Dunse, Helmfried; Henker, Erich; and Viehweg, Bernd, 4,291,892, Cl. 280-28.000.

Hennig, Hans J.; Ziemek, Peter; and Schellmann, Erhard, to Bayer Aktiengesellschaft. Process for the preparation of organic polyisocyanates containing urea groups. 4,292,255, Cl. 260-453.0AR.

Henrichon, Ernest G., Jr., to Hendrix Electronics, Inc. System and method for processing horizontal line characteristics in an image. 4,292,622, Cl. 340-146.3SG.

Henry, Michael F.: *See*—
Gigliotti, Michael F. X.; Jackson, Melvin R.; Henry, Michael F.; Woodford, David A.; Yang, Sherwin S.; and Bruch, Charles A., 4,292,076, Cl. 75-170.000.

Henry, Raymond; and Simon, Jacques, to Thomson-CSF. Opto-electronic coupling head. 4,291,942, Cl. 350-96.200.

Henry, Sam W.: *See*—
Gebarowski, Peter D.; and Henry, Sam W., 4,292,504, Cl. 219-542.000.

Hensley, John J.: *See*—
Grosjean, William C.; and Hensley, John J., 4,292,008, Cl. 415-115.000.

Hentschel, Karl-Heinz; Dhein, Rolf; and Schule, Wolfgang, to Bayer Aktiengesellschaft. Lubricating oils for the working of metals. 4,292,187, Cl. 252-49.500.

Herlitze, Gerd: *See*—
Voges, Karl-Friedrich; and Herlitze, Gerd, 4,291,706, Cl. 128-762.000.

Herman, Justin, to Shaw Mudge & Company. Fragrance dispersant composition. 4,292,211, Cl. 252-529.000.

Hermes Precisa International S.A.: *See*—
Gagnebin, Gustave, 4,291,993, Cl. 400-144.200.

Herne, Robert H., Jr. Efficient fuel burning stove or furnace with thermal energy slow propagation flue structure. 4,291,669, Cl. 126-83.000.

Herschdorfer, C. George; and Vaughan, Dennis J., to Clark-Schwebel Fiber Glass Corp. Process of producing reinforced laminates from crosslinkable thermoplastic olefin polymer material. 4,292,106, Cl. 156-243.000.

Hersom, Wallace N.; and Crum, John E., to LH Research. Output stage for switching regulated power supply. 4,292,665, Cl. 363-141.000.

Hetz, Walter; and Derndinger, Walter, to Siemens Aktiengeselschaft. Apparatus for ultrasonic scanning of objects. 4,291,578, Cl. 73-633.000.

Heyman, Philip M.; and Bortfeld, David P., to RCA Corporation. Apparatus and method for reading an identifying label on an information record. 4,292,511, Cl. 235-454.000.

Heynisch, Hinrich; Huebner, Erwin; and Barth, Heinz, to Siemens Aktiengesellschaft. Traveling wave tube with a helical delay line. 4,292,566, Cl. 315-3.500.

Heyraud, Marc. Method of making self-supporting rotor coil dc-machine. 4,291,457, Cl. 29-598.000.

Hickman, Ronald P., to Tekron Licensing B.V. Workbench. 4,291,869, Cl. 269-139.000.

Hicks, Bruce W.; and Hicks, Jerry D., to Rio Linda Chemical Company. Chlorine dioxide generation process. 4,292,292, Cl. 423-477.000.

Hicks, Jerry D.: *See*—
Hicks, Bruce W.; and Hicks, Jerry D., 4,292,292, Cl. 423-477.000.

Higashi, Yasunaga. Workpiece treating barrel. 4,291,503, Cl. 51-164.100.

Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, to Takeda Chemical Industries, Ltd. Antibiotics C-14482 B_1, B_2 and B_3. 4,292,309, Cl. 424-119.000.

Higashiguchi, Shigehiko. Method for preparing flock transfer including drying release adhesive prior to applying flock. 4,292,100, Cl. 156-72.000.

Highland, Edward, to Fiat-Allis Construction Machinery, Inc. Shifting lever brakes off restriction latch. 4,291,589, Cl. 74-526.000.

Highland Manufacturing & Sales Co.: *See*—
Weder, Erwin H.; and Weder, Donald E., 4,292,266, Cl. 264-140.000.

Hightower, Ronald. Janitor's rake for removing staples imbedded in carpet. 4,291,430, Cl. 15-142.000.

Higuchi, Yoshiro: *See*—
Ito, Yasuro; Higuchi, Yoshiro; Mochida, Yutaka; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,292,351, Cl. 427-403.000.

Hild, Manfred. Keyboard for a miniature calculator. 4,292,510, Cl. 235-145.00R.

Hill, Kenneth O.: *See*—
Kawasaki, Brian S.; Hill, Kenneth O.; and Johnson, Derwyn C., 4,291,940, Cl. 350-96.150.

Hill, Lawrence W.; Stoodley III, Thomas J.; and Malcolm, Ronald, to Modicon Div. Gould Inc. Programmable controller. 4,292,666, Cl. 364-104.000.

Hill, Stephen R.; De Pinto, Victor M.; and Gillen, John D., to Tone Commanders Systems, Inc. Expandable link telephone intercom system. 4,292,475, Cl. 179-99.00A.

Hillberg, Robert L., to Wildey Firearms Company, Inc. Firearm magazine safety mechanism. 4,291,481, Cl. 42-70.00A.

Hilti Aktiengesellschaft: *See*—
Lang, Gusztav; Storck, Friedrich; and Seghezzi, Hans-Dieter, 4,291,608, Cl. 411-16.000.

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Hino, Mitsuaki, to Nippon Klingage Kabushiki Kaisha. Residual voltage regulating circuit for hall element. 4,292,582, Cl. 323-294.000.

Hirata, Mituto, to Toyo Kagaku Kabushiki Kaisha. Method and apparatus for manufacturing corrugated tubes. 4,292,113, Cl. 156-428.000.

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Hirt, John H., 4,292,020, Cl. 431-5.000.

Hirt, John H., to Hirt Combustion Engineers. Method and apparatus for abatement of gasoline vapor emissions. 4,292,020, Cl. 431-5.000.

Hisaka Works, Limited: *See*—
Sumitomo, Hiroyuki, 4,291,759, Cl. 165-146.000.

Hitachi Cable Ltd.: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Keizo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,291,644, Cl. 118-704.000.

Hitachi, Ltd.: *See*—
Ishizuka, Kohei; Kita, Yasuhiro; and Maeda, Narimichi, 4,292,596, Cl. 330-86.000.
Onda, Kenichi; and Tokunaga, Norikazu, 4,292,550, Cl. 307-252.00A.
Sakurai, Shoichiro; and Otani, Tadahiko, 4,292,258, Cl. 261-39.00A.
Sasaki, Masayoshi; Ishii, Yoshimi; Yoshida, Tomiharu; and Sugiyama, Sen, 4,292,133, Cl. 176-36.00R.
Satou, Takehide; Yoshida, Kasumi; Sagusa, Hisayuki; Ohno, Osamu; and Abe, Tetuaki, 4,291,986, Cl. 356-410.000.
Suzuki, Tomohiro, 4,292,131, Cl. 176-36.00C.
Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, 4,291,587, Cl. 74-363.000.

Takeda, Renzo; Kurihara, Kunitoshi; and Uchikawa, Sadao, 4,292,128, Cl. 176-20.00R.
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nishihara, Motohisa; and Nagata, Takeo, 4,292,618, Cl. 338-5.000.
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; and Furukawa, Yosio, 4,291,926, Cl. 308-73.000.
Wada, Takeshi; Ienaka, Masanori; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,292,549, Cl. 307-247.00R.
Yokoyama, Toshiaki; Hara, Akira; and Okuyama, Takeshi, 4,292,533, Cl. 290-40.00B.
Yumde, Yasufumi; and Furuhata, Takashi, 4,292,652, Cl. 358-138.000.

Hiyama Farms, Inc.: *See*—
Hiyama, Kazuo; and Hiyama, Howard K., 4,291,526, Cl. 56-330.000.

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Hiyama, Kazuo; and Hiyama, Howard K., 4,291,526, Cl. 56-330.000.

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Hobart Corporation: *See*—
Warner, Norbert C.; and Treiber, Fritz F., 4,291,516, Cl. 53-219.000.

Hobrecht, Charles E.: *See*—
Fritchle, Cliff D.; Hobrecht, Charles E.; and Scott, Allan W., 4,292,567, Cl. 315-3.500.

Hock, Jules M. Method of manufacturing a ring spring for composite machinery seals. 4,292,269, Cl. 264-299.000.

Hoechst Roussel Pharmaceuticals Incorporated: *See*—
Martin, Lawrence L.; and Worm, Manfred, 4,292,243, Cl. 260-340.90R.
Martin, Lawrence L.; and Worm, Manfred, 4,292,245, Cl. 260-346.220.

Hoefer, Peter S.; and Whitesides, Michael, to Hoefer Scientific Instruments. Vertical gel slab electrophoresis apparatus. 4,292,161, Cl. 204-299.00R.

Hoefer Scientific Instruments: *See*—
Hoefer, Peter S.; and Whitesides, Michael, 4,292,161, Cl. 204-299.00R.

Hoeft, Werner H., to Signetics Corporation. Voltage and temperature stabilized constant current source circuit. 4,292,583, Cl. 323-316.000.

Hoffmann, Gerhard: *See*—
Lechtken, Peter; Bronstert, Bernd; Hoffmann, Gerhard; Vyvial, Rudolf; and Lynch, John, 4,292,152, Cl. 204-159.150.
Steinberg, Klaus; and Hoffmann, Gerhard, 4,291,501, Cl. 49-386.000.

Hoffmann-La Roche Inc.: *See*—
Montavon, Marc; and Reiner, Roland, 4,292,428, Cl. 544-27.000.

Hoffmann, Werner; and Thoemel, Frank, to BASF Aktiengesellschaft. Novel 2,4-disubstituted pyran derivatives, their preparation and their use as scents. 4,292,244, Cl. 260-345.100.

Holcomb, Warren N.: *See*—
Baldwin, Bryce R.; Brady, Laurence M.; and Holcomb, Warren N., 4,292,000, Cl. 403-320.000.

Hollingsworth, Elmont E., to Minnesota Mining and Manufacturing Company. Graphic forming device with toggle clamped lamp arm. 4,291,957, Cl. 354-14.000.

Homan, Gary R.; and Lee, Chi-Long, to Dow Corning Corporation. Oxygen-curable mercapto-functional organosilicon-organic compound compositions catalyzed by metal carbonyl compounds and method of forming higher molecular weight products therefrom. 4,292,422, Cl. 528-15.000.

Homeier, Edwin H.; Dodds, Alan R.; and Imai, Tamotsu, to UOP Inc. Catalyst recovery. 4,292,196, Cl. 252-412.000.

Honda, Sinya; Komura, Takeshi; Sugita, Naomi; and Okamoto, Tatuya, to Nippon Tungsten Co., Ltd. Electrical contact material. 4,292,078, Cl. 75-176.000.

Honda, Zenjiro: *See*—
Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya, Hitoshi, 4,292,417, Cl. 525-510.000.

Honeywell Inc.: *See*—
Elmberg, Dwayne R., 4,291,716, Cl. 137-83.000.

Honeywell Information Systems Inc.: *See*—
Miller, Robert C.; Bradley, John J.; King, Richard L.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,292,668, Cl. 364-200.000.

Honor Gard, Inc.: *See*—
Domkowski, Ronald A., 4,291,831, Cl. 232-15.000.

Hoogovens Ijmuiden, B.V.: *See*—
Pelt, Cornelis P.; and De Jong, Hendrikus, 4,291,854, Cl. 246-271.000.

Hooker Chemicals & Plastics Corp.: *See*—
Chang, Eng-Pi; Lazarz, Christine A.; and Cook, Edward H., Jr., 4,292,146, Cl. 204-98.000.

Hooper, David C.; Johnson, George A.; and Peter, Donald, to Lever Brothers Company. Personal washing detergent bars with an effective amount of a citric acid ester. 4,292,192, Cl. 252-132.000.

Hoover, Edward D.: *See*—
Wilson, John F.; Hoover, Edward D.; Hammond, Philip K.; Moshier, William A.; Woodell, Jack L.; Spaniol, John W.; Bowerman, John J.; Bieber, Larry C.; and Perlman, Marvin, 4,292,465, Cl. 178-3.000.

Hoover Universal, Inc.: *See*—
Mizelle, Ned W., 4,291,914, Cl. 297-361.000.

Hoppe, Walter, to Max-Planck-Gesellshaft zur Forderung der Wissenschaften e.V. Specimen adjustment method and system for a corpuscular beam apparatus. 4,292,523, Cl. 250-442.000.

Horike, Akihiro: *See*—
Inata, Hiroo; Ogasawara, Makoto; Morinaga, Tsuto; and Horike, Akihiro, 4,292,151, Cl. 204-159.150.

Horikoshi, Kouki: *See*—
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, 4,292,044, Cl. 44-1.00R.

Horizons Research Incorporated: *See*—
Straughan, Virgil E.; and Wainer, Eugene, 4,292,384, Cl. 430-5.000.

Horlacher, Walter R., III: *See*—
Schukei, Glen E.; Horlacher, Walter R., III; and Sampson, William T., 4,292,132, Cl. 176-36.00S.

Horwitt, Laurence G. High-production method for making grooved resistance ribbon for electrical heating coils. 4,291,560, Cl. 72-186.000.

Hosek, William S., to Curtiss Wright Corporation. Pressurized fluidized bed combustor and coal gun construction therefor. 4,292,022, Cl. 431-170.000.

Hosek, William S.: *See*—
DeFeo, Angelo; and Hosek, William S., 4,292,023, Cl. 431-170.000.

Hoskinson, Gordon H. Incinerator. 4,291,633, Cl. 110-235.000.

Hosler, Peter: *See*—
Lyons, James E.; Hosler, Peter; and Suntech, Inc., 4,292,219, Cl. 260-29.6ME.

Hosokawa, Masuo; Yokoyama, Tohei; and Kaya, Noriyoshi, to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho. Apparatus for classifying particles. 4,292,172, Cl. 209-144.000.

Hosono, Nagao: *See*—
Kanbe, Junichiro; Toyono, Tsutomu; Hosono, Nagao; and Takahashi, Tohru, 4,292,387, Cl. 430-102.000.

Hovel, Harold J., to International Business Machines Corporation. Amorphous-crystalline tandem solar cell. 4,292,461, Cl. 136-249.000.

Hoveler, Egon: *See*—
Zodrow, Rudolf; and Hoveler, Egon, 4,292,117, Cl. 156-578.000.

Hover, George W.: *See*—
Gilchrist, Ralph E.; Hover, George W.; and Barber, Robert M., 4,291,765, Cl. 166-273.000.

Hovorka, J. Warren. Football statistic pegboard. 4,292,507, Cl. 235-90.000.

Howell, E. Keith, to General Electric Company. Remotely switchable residential circuit breaker. 4,292,612, Cl. 335-14.000.

Hoy, Malcolm G.; and Reichelt, Walter R., to Aluminum Company of America. Vertical plate welding using double bevel joint. 4,292,496, Cl. 219-126.000.

Hritz, Michael. Apparatus for rotational molding. 4,292,015, Cl. 425-73.000.

Huber, Guntram: *See*—
Schmid, Walter; Breitschwerdt, Werner; and Huber, Guntram, 4,291,919, Cl. 297-483.000.

Huber, Helmut X.: *See*—
Ozin, Geoffrey A.; Francis, Colin G.; and Huber, Helmut X., 4,292,253, Cl. 260-429.500.

Huddleston, George R., Jr.; Turner, James W.; and Konter, Kenneth D., to B.F. Goodrich Company, The. Process for recovering vinyl polymers from emulsion polymerization latices. 4,292,424, Cl. 528-500.000.

Hudson, James L.: *See*—
Weiss, Olin E.; Davis, Grant L.; Hudson, James L.; and Dowell, Harlan T., 4,292,108, Cl. 156-259.000.

Huebner, Erwin: *See*—
Heynisch, Hinrich; Huebner, Erwin; and Barth, Heinz, 4,292,566, Cl. 315-3.500.

Hughes Aircraft Company: *See*—
Leo, Bruno S., 4,291,547, Cl. 62-402.000.
Pepper, David M.; and Klein, Marvin B., 4,291,950, Cl. 350-389.000.

Humme, Gert: *See*—
Binsack, Rudolf; Rempel, Dieter; Humme, Gert; and Ott, Karl-Heinz, 4,292,233, Cl. 260-40.00R.

Hunt, Arthur J.; and Hunt, Arthur J., Jr. Screw press with controllable rear door. 4,291,619, Cl. 100-43.000.

Hunt, Arthur J., Jr.: *See*—
Hunt, Arthur J.; and Hunt, Arthur J., Jr., 4,291,619, Cl. 100-43.000.

Husain, Matloob; Lai, Ban-Yen; and Maher, James B., to Chicago Bridge & Iron Company. Power producing dry cooling apparatus and method. 4,291,538, Cl. 60-661.000.

Hustler, David, to Rolls-Royce Limited. Porous metal sheet laminate. 4,292,376, Cl. 428-593.000.

Hutchinson, Marcus H. R., to National Research Development Corporation. Exciplex lasers. 4,292,603, Cl. 331-94.50G.

Hyatt, Everett C.; and Hyatt, Everett C. Gas fired fireplace insert with heat extractor. 4,291,670, Cl. 126-121.000.

Hyatt, Everett C.: *See*—
Hyatt, Everett C.; and Hyatt, Everett C., 4,291,670, Cl. 126-121.000.

Hydac, Inc.: *See*—
Evans, James D.; and Pool, Sam L., 4,292,671, Cl. 364-433.000.

Hyle, Michael J.: *See*—
Dalrymple, Philip W.; Hyle, Michael J.; Myers, Daryl L.; and Wright, James G., Jr., 4,291,841, Cl. 242-18.00A.

Ibaragi, Toshio: *See*—
Saito, Akira; Yamori, Akio; and Ibaragi, Toshio, 4,292,414, Cl. 525-255.000.

Ibigawa Electric Industry Co., Ltd.: *See—*
Enomoto, Ryo; Yoshioka, Mitihiro; and Yokoyama, Takao, 4,292,276, Cl. 422-199.000.

Ibsen, Robert L.; and Reed, William R., Jr., to Den-Mat, Inc. Composition for repair of porcelain fixtures. 4,292,236, Cl. 260-42.520.

ICI Americas Inc.: *See—*
deBerardinis, Albert J.; and Kruse, Walter M., 4,292,451, Cl. 568-863.000.

Ida, Yoshiaki; Fukuda, Shiro; and Imamura, Osayoshi, to Mitsubishi Denki Kabushiki Kaisha. Abnormality sensing device for gas-insulated electric apparatus. 4,291,989, Cl. 356-440.000.

Ideal Toy Corporation: *See—*
Ensmann, Burt W.; Kuriloff, Fredric M.; and Rosenhagen, William, 4,291,877, Cl. 273-86.00B.

Idemitsu Kosan Company Limited: *See—*
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Ieki, Mitsuru: *See—*
Niguchi, Hirotoshi; and Ieki, Mitsuru, 4,291,781, Cl. 181-169.000.

Ienaka, Masanori: *See—*
Wada, Takeshi; Ienaka, Masanori; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,292,549, Cl. 307-247.00R.

Iivarinen, Antero. Apparatus for assembling a projectile and a booster charge case to a shot. 4,291,609, Cl. 86-1.00R.

Ikeda, Kiyoshi: *See—*
Kudo, Daijiro; and Ikeda, Kiyoshi, 4,292,153, Cl. 204-164.000.

Ikeda, Masaki, to Tomy Kogyo Co., Inc. Moving toys. 4,291,490, Cl. 46-251.000.

Ikeda, Sadaharu: *See—*
Ikeda, Tomoaki; Sigyoo, Masamiti; Ikeda, Sadaharu; Yoshida, Satoshi; and Tomotsu, Takeshi, 4,292,388, Cl. 430-162.000.

Ikeda, Tomoaki; Sigyoo, Masamiti; Ikeda, Sadaharu; Yoshida, Satoshi; and Tomotsu, Takeshi, to Fuji Photo Film Co., Ltd. Image-forming material of aluminum-iron alloy. 4,292,388, Cl. 430-162.000.

Ikeda, Tomoaki; Shinozaki, Fumiaki; and Nakao, Sho, to Fuji Photo Film Co., Ltd. Protective layer of fatty acid or nylon on photosensitive resin for metal-image forming element. 4,292,392, Cl. 430-271.000.

Ikeda, Tomoaki: *See—*
Wada, Minoru; Shinozaki, Fumiaki; Takahashi, Yohnosuke; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,292,393, Cl. 430-275.000.
Wada, Minoru; Shinozaki, Fumiaki; Takahashi, Yohnosuke; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,292,395, Cl. 430-299.000.

Ikemori, Keiji, to Canon Kabushiki Kaisha. Compact type retrofocus lens. 4,291,951, Cl. 350-458.000.

Ikura, Hiroshi: *See—*
Suzuki, Yoshiki; Ikura, Hiroshi; and Yamashita, Gentaro, 4,292,299, Cl. 424-16.000.

Illinois Tool Works Inc.: *See—*
McVey, John K., 4,292,617, Cl. 337-407.000.
Wagner, David P., 4,292,007, Cl. 411-156.000.

Imai, Tamotsu: *See—*
Homeier, Edwin H.; Dodds, Alan R.; and Imai, Tamotsu, 4,292,196, Cl. 252-412.000.

Imamura, Osayoshi: *See—*
Ida, Yoshiaki; Fukuda, Shiro; and Imamura, Osayoshi, 4,291,989, Cl. 356-440.000.

IMBAC S.p.A.: *See—*
Santambrogio, Vincenzo, 4,291,593, Cl. 74-799.000.

IMI Marston Limited: *See—*
Warne, Michael A., 4,292,149, Cl. 204-147.000.

Imperial Chemical Industries Limited: *See—*
Briggs, Peter J., 4,292,363, Cl. 428-247.000.
Brooks, Herbert; and Waite, Frederick A., 4,292,045, Cl. 44-62.000.
Cameron, Ivor, 4,292,536, Cl. 250-359.000.
Riley, Norman, 4,292,446, Cl. 564-221.000.

Inata, Hiroo; Ogasawara, Makoto; Morinaga, Tsuto; and Horike, Akihiro, to Teijin Limited. Process for preparing a cured copolyetherester elastomeric composition. 4,292,151, Cl. 204-159.150.

Indak Manufacturing Corp.: *See—*
Raab, Andrew F.; and Halsted, Raymond T., 4,291,725, Cl. 137-625.250.

Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
Alluto, Luigi, 4,291,543, Cl. 62-158.000.

Inoue Gomu Kogyo Kabushiki Kaisha: *See—*
Katoh, Hisanori, 4,292,354, Cl. 428-31.000.

Inoue, Hiromitsu: *See—*
Kondo, Mikio; Inoue, Hiromitsu; and Ohashi, Hiroshi, 4,292,679, Cl. 367-188.000.

Inoue, Yoshio: *See—*
Takeuchi, Satoshi; Akada, Masanori; Fujii, Hitoshi; Toida, Takashi; Takamizawa, Minoru; and Inoue, Yoshio, 4,292,397, Cl. 430-303.000.

Institute of Gas Technology: *See—*
Yie, Gene G.; and Bevan, Thomas M., 4,291,727, Cl. 138-93.000.

Institute of Paper Chemistry, The: *See—*
Baum, Gary A.; and Habeger, Charles C., 4,291,577, Cl. 73-597.000.

Instituto Venezolano de Investigaciones Cientificas (IVIC): *See—*
Suarez, Ricardo; Chang, Oscar; and Adam, Vladimir, 4,292,548, Cl. 307-465.000.

Intermedicat GmbH: *See—*
Fuchs, Heinz, deceased; Muller, Hans-Friedrich; and Hecht, Hildegard, 4,291,698, Cl. 128-335.000.
Voges, Karl-Friedrich; and Herlitze, Gerd, 4,291,706, Cl. 128-762.000.

International Business Machines Corp.: *See—*
Denis, Bernard A., 4,292,675, Cl. 365-156.000.
Eswaran, Kapali P.; Hamacher, Vincent C.; and Shedler, Gerald S., 4,292,623, Cl. 340-147.00R.
Hovel, Harold J., 4,292,461, Cl. 136-249.000.
Kenney, Eugene J.; Lazzarini, Donald J.; and Winters, Robert J., 4,292,230, Cl. 260-33.2EP.
Lammers, Gerald B.; and Ream, Gregory L., 4,292,640, Cl. 346-75.000.
Smith, Thor L.; and Weiche, William J., 4,291,994, Cl. 400-241.100.
Thurston, Thomas R., 4,292,529, Cl. 250-561.000.
Wagner, Dietmar, 4,291,938, Cl. 350-91.000.

International Flavors & Fragrances Inc.: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,292,447, Cl. 568-378.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,292,193, Cl. 252-174.110.

International Folding Paper Box Co., Inc.: *See—*
Giordano, Vincent; and Senor, Charles, 4,291,807, Cl. 206-626.000.

International Harvester Company: *See—*
Grosjean, William C.; and Hensley, John J., 4,292,008, Cl. 415-115.000.

International Nickel Co., Inc., The: *See—*
Petersen, Walter A.; Travis, Jonathan A.; and Badia, Frank A., 4,292,377, Cl. 428-675.000.
Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., 4,292,079, Cl. 75-232.000.

International Standard Electric Corporation: *See—*
Crossland, William A.; Morrissy, Joseph H.; and Coates, David, 4,291,948, Cl. 350-340.000.
Venken, Jan H. G.; and Robijns, Jozef A. M., 4,292,473, Cl. 179-18.0FA.

International Synthetic Rubber Co., Ltd.: *See—*
Berg, Lloyd, 4,292,142, Cl. 203-51.000.

International Telephone and Telegraph Corporation: *See—*
Du Bae, Hyung, 4,292,673, Cl. 364-509.000.
Grimsby, Emerson A.; and Levasheff, Stanley W., 4,291,502, Cl. 51-120.000.
Landgreen, Eleanor A., 4,291,930, Cl. 339-14.00P.

Interstate Electronics Corp.: *See—*
An, Byung H., 4,292,470, Cl. 179-1.50D.

Intonti, Antonio: *See—*
Intonti, Francesco; and Intonti, Antonio, 4,291,419, Cl. 3-1.500.

Intonti, Francesco; and Intonti, Antonio. Implantable cardiac valve prosthesis. 4,291,419, Cl. 3-1.500.

Inveresk Research International: *See—*
Byrne, Geoffry A.; and Aylott, Ross I., 4,292,300, Cl. 424-19.000.

Ishida, Minoru: *See—*
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Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya, Hitoshi, to Daicel Ltd. Semipermeable membrane. 4,292,417, Cl. 525-510.000.

Ishii, Masanori; and Kameya, Kazuo, to Toko, Inc. Power control circuit. 4,292,544, Cl. 307-52.000.

Ishii, Yoshimi: *See—*
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Ishikawa, Norio: *See—*
Yuasa, Yoshio; Ishikawa, Norio; and Taniguchi, Nobuyuki, 4,291,979, Cl. 356-218.000.

Ishikawa, Takatoshi: *See—*
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Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
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Ishimaru, Kenji: *See—*
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Ishiwata, Mamoru; Uematsu, Shinji; Ozaki, Kazuo; and Ishiyama, Masashi, to Fuji Photo Film Co., Ltd. Coating method and apparatus. 4,292,349, Cl. 427-335.000.

Ishiyama, Masashi: *See—*
Ishiwata, Mamoru; Uematsu, Shinji; Ozaki, Kazuo; and Ishiyama, Masashi, 4,292,349, Cl. 427-335.000.

Ishizuka, Kohei; Kita, Yasuhiro; and Maeda, Narimichi, to Hitachi, Ltd. Gain control circuit. 4,292,596, Cl. 330-86.000.

Island Creek Coal Co.: *See—*
Yale, Boyd R., 4,291,777, Cl. 180-24.060.

Isley, Ralph E., to Standard Oil Company, The. Physical property improvement in nitrile resins by use of certain processing aids and fillers. 4,292,228, Cl. 260-30.40A.

Isoard, Bernard, to Rhone-Poulenc-Textile. Spindle for winding textile yarns. 4,291,842, Cl. 242-46.500.

Italfarmaco S.p.A.: *See—*
Cremonesi, Pietro, 4,292,409, Cl. 435-288.000.

Itatani, Hiroshi; Shiotani, Akinori; and Yokota, Akiyoshi, to Ube Industries, Ltd. Method of producing biphenyltetracarboxylic esters. 4,292,435, Cl. 560-96.000.

Itek Corporation: *See—*
Lobdell, Alban J.; and Rupp, Wiktor J., 4,292,030, Cl. 434-262.000.

Ito, Akinori: *See—*
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Ito, Kunio: *See*—
Kojima, Hiroshi; Ito, Kunio; Akiyama, Masami; and Tanaka, Takeshi, 4,292,389, Cl. 430-169.000.

Ito, Sadayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Balancing piece for ventilated brake discs. 4,291,786, Cl. 188-218.00A.

Ito, Tadashi; Murakami, Hiroyasu; Suzuki, Masayuki; Yamamichi, Masayoshi; Sakurada, Nobuaki; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Display device. 4,291,960, Cl. 354-53.000.

Ito, Yasuro; Higuchi, Yoshiro; Mochida, Yutaka; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, to Ito, Yasuro; and Taisei Corporation. Method of blasting concrete. 4,292,351, Cl. 427-403.000.

Itoh, Isamu; Hashimura, Taiji; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Bleaching composition for photographic processing. 4,292,401, Cl. 430-393.000.

Iversen, Niels A.; Pedersen, Jorgen; and Lolk, Hans, to Arkay Packaging Corporation. Filter holder. 4,291,904, Cl. 285-162.000.

Ivy, Joel G., to Dresser Industries, Inc. Method and apparatus for regulating electric motor armature currents. 4,292,572, Cl. 318-52.000.

Iwan, Wilfred D.; and Gyi, Ko K., to Burroughs Corporation. Partitionable flexible disk pack. 4,292,657, Cl. 360-98.000.

Iwata, Shizuo: *See*—
Ogawa, Koichi; Tezuka, Shichigoro; Terasawa, Masatoshi; and Iwata, Shizuo, 4,292,329, Cl. 426-5.000.

Iwatani Sangyo Kabushiki Kaisha: *See*—
Miyagawa, Yoshihisa, 4,292,021, Cl. 431-13.000.

Iwawaki, Yasutaka: *See*—
Yamasaki, Hitoshi; and Iwawaki, Yasutaka, 4,291,620, Cl. 101-99.000.

Iyengar, Jagannathan N.: *See*—
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., 4,292,286, Cl. 423-223.000.

J. D. Engineering Services Pty. Ltd.: *See*—
Marrington, Jack D., 4,291,820, Cl. 222-70.000.

J & H Manufacturing, Inc.: *See*—
Jones, Herman L.; and Kent, Richard F., 4,292,115, Cl. 156-502.000.

Jackson, Andrew H., Jr. Positive locking adjustable mount for camera and flash. 4,291,967, Cl. 354-293.000.

Jackson, Melvin R.: *See*—
Gigliotti, Michael F. X.; Jackson, Melvin R.; Henry, Michael F.; Woodford, David A.; Yang, Sherwin S.; and Bruch, Charles A., 4,292,076, Cl. 75-170.000.

Jackson, Thomas. Lens mask for cameras and photographic method. 4,291,962, Cl. 354-122.000.

Jacoby, Charles H. Monitoring earth/rock movements. 4,291,581, Cl. 73-784.000.

Jagenberg Werke AG: *See*—
Zodrow, Rudolf; and Hoveler, Egon, 4,292,117, Cl. 156-578.000.

Jahn, Alex K., to Badische Corporation. Imparting anti-soiling properties to fibers. 4,292,182, Cl. 252-8.600.

Jalan, Hemant: *See*—
Michaels, Alan S.; Weiner, Michael W.; and Jalan, Hemant, 4,292,227, Cl. 260-29.60H.

Janick, Jules; Hasegawa, Paul M.; and Pence, Valerie C., to Purdue Research Foundation. Method for production of mature asexual cacao embryos, and product thereof. 4,291,498, Cl. 47-58.000.

Japan Crown Cork Co., Ltd.: *See*—
Murayama, Kashiwa, 4,291,567, Cl. 72-347.000.

Japan Synthetic Rubber Company Limited: *See*—
Kotani, Teizo; Arai, Kozo; Fukui, Shiomi; and Nagata, Masaki, 4,292,261, Cl. 264-24.000.

Japan Tobacco & Salt Public Corporation, The: *See*—
Okumoto, Yutaka, 4,292,522, Cl. 250-358.00R.

Jehenson, Pierre: *See*—
Luchtmans, Fernand; Jehenson, Pierre; and Pisoni, Angelo, 4,292,521, Cl. 250-323.000.

Jelaca, Svetozar, to Luburich, George, a part interest. Gas saving transmission. 4,291,595, Cl. 74-863.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Aldag, Henry R.; Marling, John B.; and Pike, Charles T., 4,292,601, Cl. 331-94.50L.

Jessen, John W. Means for performing an emergency cricothyrotomy. 4,291,690, Cl. 128-200.260.

Jikihara, Tetsuo: *See*—
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,292,070, Cl. 71-96.000.

John Lysaght International Holdings S.A.: *See*—
Harding, Claude G., 4,291,515, Cl. 52-694.000.

Johncock, Allan W.: *See*—
Wright, Robert M.; and Johncock, Allan W., 4,292,138, Cl. 203-2.000.

Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Apparatus for automatically selecting a preselected focal position for a lens system. 4,291,965, Cl. 354-195.000.

Johnson, Dale A.: *See*—
Bulle, Marshall; and Johnson, Dale A., 4,291,557, Cl. 70-58.000.

Johnson, Daniel. Bottle carton filling machine. 4,291,519, Cl. 53-534.000.

Johnson, Dannis R.; Foster, Elgin J.; and Soukup, Richard J., to Thermo King Corporation. Power and control system arrangement for transport refrigeration unit. 4,292,661, Cl. 361-393.000.

Johnson, Derwyn C.: *See*—
Kawasaki, Brian S.; Hill, Kenneth O.; and Johnson, Derwyn C., 4,291,940, Cl. 350-96.150.

Johnson, Donald A.; and Nimry, Baker N., to Nalco Chemical Company. Method for the oxidation of water-soluble sulfide compounds to higher oxidation states. 4,292,293, Cl. 423-571.000.

Johnson, George A.: *See*—
Hooper, David C.; Johnson, George A.; and Peter, Donald, 4,292,192, Cl. 252-132.000.

Johnson, Henry C., to RCA Corporation. Interrogating radar for use with tagged targets. 4,292,637, Cl. 343-6.5SS.

Johnson & Johnson Products, Inc.: *See*—
Ring, David F., 4,291,696, Cl. 128-263.000.

Johnson, Lewis A.; and Wirostko, Emil. Method for treatment of human eye disease. 4,292,327, Cl. 424-325.000.

Johnson, Lloyd D., to Standard-Knapp, Inc. Packing case tab slitter. 4,291,518, Cl. 53-491.000.

Johnson Matthey, Inc.: *See*—
Dolan, Calvin M., 4,292,348, Cl. 427-299.000.

Johnson, Morris V., to National-Standard Company. Rotary cutting blade assembly. 4,291,445, Cl. 29-78.000.

Johnson, Ronald E.: *See*—
Heimbach, Kim P.; and Johnson, Ronald E., 4,292,104, Cl. 156-235.000.

Johnson, William R., to Boeing Company, The. Thermal insulation for aircraft fuselage. 4,291,851, Cl. 244-119.000.

Johnstone, Charles W., to Schlumberger Technology Corp. Methods and apparatus for measuring thermal neutron decay characteristics of earth formations. 4,292,518, Cl. 250-262.000.

Jollois, Jean-Marie, to Labavia-S.G.E. Speed reducing equipment, particularly for vehicles. 4,292,556, Cl. 310-93.000.

Jones, David, to Lucas Industries Limited. Servo booster assembly. 4,291,534, Cl. 60-547.00R.

Jones, Herman L.; and Kent, Richard F., to J & H Manufacturing, Inc. Cartridge film unloading and splicing system. 4,292,115, Cl. 156-502.000.

Jonsson, Karl E.; and Moren, Nils F. E., to Aktiebolaget Draco. Aqueous zinc solutions for medical use. 4,292,324, Cl. 424-289.000.

Jonsson, Olof. Method for separating the fruit flesh of nuts or kernels into fibre mass, oil and cell liquid. 4,292,335, Cl. 426-489.000.

Jordan, Donald L.: *See*—
Peck, Kenneth E., Jr.; and Jordan, Donald L., 4,291,456, Cl. 29-597.000.

Jordan, Pierre. Liquid scintillation spectrometry process and apparatus. 4,292,520, Cl. 250-328.000.

Jordan, Thomas F.: *See*—
Payne, Robert D.; and Jordan, Thomas F., 4,291,640, Cl. 118-50.100.

Joseph Pollak Corporation: *See*—
Roytberg, Leo F., 4,292,483, Cl. 200-42.00A.

Jost, Max: *See*—
Dazzi, Joachim; Jost, Max; and Wick, Arnold, 4,292,232, Cl. 260-40.00P.

Joung, Jong, to Kendall Company, The. Curing fluorinated alkoxy phosphonitrile polymer with peroxide and aluminum compound. 4,292,418, Cl. 525-538.000.

Jourquin, Lucien; and Du Prez, Eddie, to S.A. PRB. Process for preparing integral skin polyurethane and polyurethane so obtained. 4,292,411, Cl. 521-51.000.

Joyce, Edward R.: *See*—
Reynolds, Ellis W.; and Joyce, Edward R., 4,291,492, Cl. 47-12.000.

Jueneman, Robert R., to Satellite Business Systems. Guard band reduction in open loop TDMA communications. 4,292,683, Cl. 370-104.000.

Juengel, Richard O.: *See*—
Bell, Seymour; and Juengel, Richard O., 4,291,466, Cl. 33-148.00H.

Jurchenko, Anatoly B.: *See*—
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A., 4,292,494, Cl. 219-76.130.

Justice, Orien N., to CamAct Pump Corp. Transmission. 4,291,588, Cl. 74-421.00R.

K. R. Evans & Associates: *See*—
Newsom, William D.; and Carnahan, James R., 4,291,433, Cl. 15-405.000.

Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho: *See*—
Hosokawa, Masuo; Yokoyama, Tohei; and Kaya, Noriyoshi, 4,292,172, Cl. 209-144.000.

Kabushiki Kaisha Kyoto Daiichi Kagaku: *See*—
Ohnishi, Masaaki; and Saito, Akio, 4,291,981, Cl. 356-244.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,291,528, Cl. 57-58.950.
Seiki, Kazuo; and Miyamoto, Noriaki, 4,291,438, Cl. 19-112.000.
Yoshizawa, Toshio; Yoshida, Yoshiaki; and Sugiura, Katsuaki, 4,291,437, Cl. 19-112.000.

Kabushikikaisha Sankyo Seisakujo: *See*—
Kato, Heizaburo; and Ogawa, Yoshio, 4,291,553, Cl. 64-29.000.

Kaczyski, Donald J.: *See*—
Chilcote, Dennis D.; and Kaczyski, Donald J., 4,292,281, Cl. 423-27.000.

Kaga, Hideharu: *See*—
Ito, Yasuro; Higuchi, Yoshiro; Mochida, Yutaka; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,292,351, Cl. 427-403.000.

Kaidoshko, Eduard A.: *See*—
Anfilov, Igor V.; Ershov, Geny S.; Kaidoshko, Eduard A.; Remizov, Jury B.; Rozhenko, Anatoly L.; Suvorov, Gennady P.; and Scherbatenko, Boris G., 4,291,971, Cl. 355-14.00R.
Kaiser, Fritz; Koch, Klaus; Schaumann, Wolfgang; and Voigtlander, Wolfgang, to Boehringer Mannheim GmbH. Cardioactive 12-dehydrodigoxin-oximes. 4,292,314, Cl. 424-182.000.
Kakaris, Aristotelis, to Akzona Incorporated. Electrical connector having improved non-decoupling mechanism. 4,291,933, Cl. 339-89.00R.
Kamada, Kazumasa; and Okada, Kazuya, to Mitsubishi Rayon Co., Ltd. Process for producing radiation-shielding plastic materials. 4,292,419, Cl. 526-192.000.
Kamensky, Jury M.: *See*—
Medovar, Boris I.; Artamonov, Viktor L.; Kirsanov, Pavel I.; Marchenko, Alexandr M.; Bogachenko, Alexei G.; Pavlov, Leonid V.; Kamensky, Jury M.; Gutnov, Ruslanbek B.; and Platonov, Pavel M., 4,291,744, Cl. 164-509.000.
Kamensky, Veniamin V.: *See*—
Sudnishnikov, Boris V.; Kamensky, Veniamin V.; Varnello, Eduard P.; and Tupitsyn, Sergei K., 4,291,774, Cl. 175-417.000.
Kameya, Kazuo: *See*—
Ishii, Masanori; and Kameya, Kazuo, 4,292,544, Cl. 307-52.000.
Kamiyama, Shinichi: *See*—
Kobayashi, Yuochi; and Kamiyama, Shinichi, 4,291,643, Cl. 118-669.000.
Kanbe, Junichiro; Toyono, Tsutomu; Hosono, Nagao; and Takahashi, Tohru, to Canon Kabushiki Kaisha. Magnetic developing method under A.C. electrical bias and apparatus therefor. 4,292,387, Cl. 430-102.000.
Kane, John L.; and Nadkarni, Vikas M., to Owens-Corning Fiberglas Corporation. Polymeric mats having continuous filaments with an asymmetrical cross-sectional shape. 4,292,365, Cl. 428-288.000.
Kaneda, Hiroshi: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; and Kaneda, Hiroshi, 4,292,369, Cl. 428-313.000.
Kaneda, Yoshiyuki: *See*—
Kishimoto, Teiji; Kochi, Hiromu; and Kaneda, Yoshiyuki, 4,292,320, Cl. 424-258.000.
Kaneko, Junichi: *See*—
Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, 4,291,587, Cl. 74-363.000.
Kaneko, Yasuo: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Keizo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,291,644, Cl. 118-704.000.
Kanto, Masaharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Shadow mask assembly for a cathode ray tube. 4,292,565, Cl. 313-407.000.
Kanzawa, Masahide: *See*—
Tanaka, Takehiko; and Kanzawa, Masahide, 4,291,888, Cl. 277-65.000.
Karnis, Alkibiadis; and Wood, John R., to Domtar Inc. Bonding properties of mechanical pulps. 4,292,122, Cl. 162-28.000.
Kasahara, Yasushi; and Ashihara, Yoshihiro, to Fujizoki Pharmaceutical Co., Ltd. Method for determining the activity of the angiotensin-converting enzyme. 4,292,404, Cl. 435-18.000.
Kasei Optonix, Ltd.: *See*—
Tanaka, Michio; Miura, Norio; and Shimiya, Keiji, 4,292,107, Cl. 156-249.000.
Kasel, Hans W.: *See*—
Wolfsgruber, Friedrich; Kasel, Hans W.; Odendahl, Manfred H. A.; and Morsdorf, Wolfram W., 4,292,075, Cl. 75-130.00R.
Kashiwagi, Kazuo: *See*—
Yanagawa, Hitoshi; Konishi, Motofumi; Ando, Yoshio; and Kashiwagi, Kazuo, 4,291,843, Cl. 242-57.000.
Kato, Heizaburo; and Ogawa, Yoshio, to Kabushikikaisha Sankyo Seisakujo. Torque limiter. 4,291,553, Cl. 64-29.000.
Kato, Osamu: *See*—
Tanaka, Hiroshi; and Kato, Osamu, 4,292,049, Cl. 51-309.000.
Kato, Takashi: *See*—
Nakamura, Norihiko; Nakanishi, Kiyoshi; and Kato, Takashi, 4,291,662, Cl. 123-661.000.
Kato, Tetuo, to Tokico Ltd. Cylinder head. 4,291,788, Cl. 188-322.170.
Katoh, Hisanori, to Inoue Gomu Kogyo Kabushiki Kaisha. Moldings for automobiles. 4,292,354, Cl. 428-31.000.
Katoh, Kazunobu; and Makino, Teruyoshi, to Fuji Photo Film Co., Ltd. Integral diffusion transfer photographic film unit. 4,292,390, Cl. 430-207.000.
Katsube, Junki: *See*—
Ono, Keiichi; Sugie, Akihiko; Kawakami, Hajime; and Katsube, Junki, 4,292,432, Cl. 549-35.000.
Katz, Bernard R. Electronic organ. 4,291,603, Cl. 84-1.010.
Kauffman, Clayton O., to Ketchum, James. Floating bridge for string instruments. 4,291,607, Cl. 84-299.000.
Kaufhold, Wolfgang: *See*—
Ott, Gunther; and Kaufhold, Wolfgang, 4,292,580, Cl. 323-212.000.
Kaufman, Samuel. Mist producing nozzle. 4,291,835, Cl. 239-11.000.
Kaufmann, Rudolf; Muller, Johann; and Wegehaupt, Karl-Heinrich, to Wacker-Chemie GmbH. Process for the preparation of organopolysiloxanes. 4,292,423, Cl. 528-18.000.
Kaulich, Karel: *See*—
Prohazka, Miloslav; and Kaulich, Karel, 4,291,731, Cl. 139-438.000.
Kawaguchi, Yosiyuki; Nishida, Takashi; Marukawa, Nobuaki; Tanaka, Tadakazu; and Kontani, Yoshinari, to Kobe Steel, Limited; and Nippon Koshuha Steel Co., Ltd. Process and apparatus for cutting circumferential surface to remove rod surface flaws. 4,291,600, Cl. 82-1.00C.
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Keizo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, to Hitachi Cable Ltd. Apparatus for fabricating composite metal wire. 4,291,644, Cl. 118-704.000.
Kawakami, Hajime: *See*—
Ono, Keiichi; Sugie, Akihiko; Kawakami, Hajime; and Katsube, Junki, 4,292,432, Cl. 549-35.000.
Kawamura, Yoshimi: *See*—
Tanaka, Kentaro; Shoji, Jun'ichi; Kawamura, Yoshimi; Hattori, Teruo; Kondo, Eiji; Matsumoto, Kouichi; Yoshida, Tadashi; and Tsuji, Naoki, 4,292,241, Cl. 260-245.20T.
Kawasaki, Brian S.; Hill, Kenneth O.; and Johnson, Derwyn C., to Canadian Patents & Development Ltd. Low loss access coupler for multimode optical fiber distribution systems. 4,291,940, Cl. 350-96.150.
Kawasaki, Hiroaki; and Akashi, Shigeharu, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Idemitsu Kosan Company Limited. Process for recovering heat in distillation process. 4,292,140, Cl. 203-22.000.
Kawasaki, Masami; and Sadakane, Hirofumi, to Kubota Ltd. Mower mounted on vehicle. 4,291,522, Cl. 56-15.800.
Kawasaki Steel Corporation: *See*—
Nakazato, Yoshio; Tanaka, Tomoo; Hashiguchi, Koichi; and Soeda, Naohiko, 4,292,097, Cl. 148-12.00C.
Kay, Leslie. Method of and apparatus for echo location of objects. 4,292,678, Cl. 367-102.000.
Kaya, Noriyoshi: *See*—
Hosokawa, Masuo; Yokoyama, Tohei; and Kaya, Noriyoshi, 4,292,172, Cl. 209-144.000.
Kayama, Takashi: *See*—
Uemoto, Yasuo; Togami, Shigenori; Takano, Tsumoru, deceased; Ono, Ichiro; and Kayama, Takashi, 4,292,235, Cl. 260-42.180.
Kearney & Trecker Corporation: *See*—
Cesarz, Michael R.; and Stobbe, Richard E., 4,292,577, Cl. 318-802.000.
Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing ephedrine. 4,292,301, Cl. 424-28.000.
Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing terbutaline. 4,292,302, Cl. 424-28.000.
Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing clonidine. 4,292,303, Cl. 424-28.000.
Kelen, George J., to Del Mar Avionics. Pacemaker monitoring recorder. 4,291,703, Cl. 128-711.000.
Kellner, Walter; Kniepkamp, Hermann; and Ristow, Dietrich, to Siemens Aktiengesellschaft. High cut-off frequency planar Schottky diode having a plurality of finger-like projections arranged in parallel in a transmission line. 4,292,643, Cl. 357-15.000.
Kelly, Michael J.; and Youngquist, Robert J., to Minnesota Mining and Manufacturing Company. Format for digital tape recorder. 4,292,684, Cl. 371-38.000.
Kendall Company, The: *See*—
Joung, Jong, 4,292,418, Cl. 525-538.000.
Kenmochi, Hirohito: *See*—
Nishikuri, Masao; Takeshita, Akira; and Kenmochi, Hirohito, 4,292,247, Cl. 260-381.000.
Kennecott Corporation: *See*—
Lingane, Peter J.; Redman, Michael J.; Park, Won C.; Hard, Robert A.; and Harvey, Walter W., 4,291,920, Cl. 299-4.000.
Marcantonio, Paul J., 4,292,160, Cl. 204-237.000.
Kennedy, Melvin: *See*—
Nagel, Dietmar; and Kennedy, Melvin, 4,291,878, Cl. 273-86.00R.
Kenney, Eugene J.; Lazzarini, Donald J.; and Winters, Robert J., to International Business Machines Corporation. Screen-printing composition and use thereof. 4,292,230, Cl. 260-33.2EP.
Kent, Richard F.: *See*—
Jones, Herman L.; and Kent, Richard F., 4,292,115, Cl. 156-502.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Zimmermann, Ulrich; and Pilwat, Gunter, 4,292,408, Cl. 435-173.000.
Kerr, Ronald R.; Mullins, Keith M.; and Bowie, Bruce H., to Teledyne Industries, Inc. Alarm system. 4,292,629, Cl. 340-547.000.
Kersavage, Joseph A. Structural solar collector. 4,291,679, Cl. 126-438.000.
Ketchum, James: *See*—
Kauffman, Clayton O., 4,291,607, Cl. 84-299.000.
Kewanee Boiler Corporation: *See*—
Rouf, Mohammad A., 4,292,498, Cl. 219-288.000.
Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D.; and Snipes, Wallace, 4,292,301, Cl. 424-28.000.
Keith, Alec D.; and Snipes, Wallace, 4,292,302, Cl. 424-28.000.
Keith, Alec D.; and Snipes, Wallace, 4,292,303, Cl. 424-28.000.
Kezer, Osman F., to United States of America, Army. Combined T-shape smoke projectile and launching assembly. 4,291,629, Cl. 102-334.000.
Khorin, Vladimir N.: *See*—
Sanin, Sergei A.; Ponomarenko, Jury F.; Firstov, Vladislav D.; Khorin, Vladimir N.; Ragutsky, Arnold M.; Kostjunin, Boris N.; and Bronfen, Petr M., 4,291,718, Cl. 137-87.000.

Kiikka, Oliver A., to Standard Oil Co., The. Oxydehydrogenation process for preparing indenes. 4,292,456, Cl. 585-431.000.

Kikkoman Shoyu Co., Ltd.: *See—*
Nishizawa, Yoshihiko; Aketa, Yoshihiro; and Akao, Takeshi, 4,292,334, Cl. 426-447.000.

Kilroy, Eugene J.: *See—*
Buck, Gordon H.; Gabler, Otto L.; Kilroy, Eugene J.; and Leoncavallo, Richard, 4,291,663, Cl. 124-26.000.

Kim, Choong S.; Lee, Kee J.; Kim, Hong S.; and Chae, Yung B., to Korea Institute of Science and Technology. Process for the production of hydroxymethylimidazoles. 4,292,431, Cl. 548-342.000.

Kim, Hong S.: *See—*
Kim, Choong S.; Lee, Kee J.; Kim, Hong S.; and Chae, Yung B., 4,292,431, Cl. 548-342.000.

Kim, Jin S.: *See—*
Lee, Jin W.; and Kim, Jin S., 4,291,873, Cl. 272-146.000.

Kimble, Howard J., to Union Carbide Corporation. Analysis of vinyl acetate. 4,292,042, Cl. 23-232.00R.

Kime, Wellesley R. Apparatus and method for centrifugal fluid separator. 4,292,051, Cl. 55-17.000.

Kimura, Mitsuhiro: *See—*
Nishizawa, Jun-ichi; and Kimura, Mitsuhiro, 4,292,373, Cl. 428-446.000.
Nishizawa, Jun-ichi; and Kimura, Mitsuhiro, 4,292,374, Cl. 428-446.000.

King, Arthur S. Liquid treater having electrode stripper. 4,292,163, Cl. 204-304.000.

King, Richard L.: *See—*
Miller, Robert C.; Bradley, John J.; King, Richard L.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,292,668, Cl. 364-200.000.

Kinzel, Joseph A.: *See—*
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Kirkpatrick, Joel L.; Patel, Natu R.; and Rutter, Jerry L., to Gulf Oil Corporation. Isothioureido isoindolediones and use as plant growth regulators. 4,292,071, Cl. 71-96.000.

Kirsanov, Pavel I.: *See—*
Medovar, Boris I.; Artamonov, Viktor L.; Kirsanov, Pavel I.; Marchenko, Alexandr M.; Bogachenko, Alexei G.; Pavlov, Leonid V.; Kamensky, Jury M.; Gutnov, Ruslanbek B.; and Platonov, Pavel M., 4,291,744, Cl. 164-509.000.

Kishi, Yoshinori: *See—*
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Keizo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,291,644, Cl. 118-704.000.

Kishi, Yoshio, to Sony Corporation. Motor with integral clutch. 4,292,557, Cl. 310-78.000.

Kishimoto, Teiji; Kochi, Hiromu; and Kaneda, Yoshiyuki, to Fujisawa Pharmaceutical Company, Limited. 1,2,3,4-Tetrahydroisoquinoline derivatives and the preparation thereof. 4,292,320, Cl. 424-258.000.

Kistler, Frederic E., to Schering Corp. Inhalation device. 4,291,688, Cl. 128-200.230.

Kita, Yasuhiro: *See—*
Ishizuka, Kohei; Kita, Yasuhiro; and Maeda, Narimichi, 4,292,596, Cl. 330-86.000.

Kitahara, Tohru: *See—*
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; Kitahara, Tohru; and Watanabe, Kenichi, 4,292,433, Cl. 556-479.000.

Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Multilayer analysis sheet for analyzing liquid samples. 4,292,272, Cl. 422-57.000.

Kiwala, Jacob: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,292,447, Cl. 568-378.000.

Kiyosawa, Kesaomi. Showcase. 4,291,928, Cl. 312-257.00R.

Klamer, Reuben B. Kaleidoscopic game device. 4,291,881, Cl. 273-142.00H.

Klaren, Dick G., to Pieper, Gustav Adolf. Multistage-expansion evaporator. 4,292,135, Cl. 202-173.000.

Klasing Industries, Inc.: *See—*
Klasing, Wayne G., 4,291,793, Cl. 192-95.000.

Klasing, Wayne G., to Klasing Industries, Inc. Hand brake mechanism adapted for use on a railway car. 4,291,793, Cl. 192-95.000.

Kleeb, Thomas R.: *See—*
Thrower, Stephen W.; Criss, George H.; and Kleeb, Thomas R., 4,292,084, Cl. 501-107.000.

Klees, Garry W., to Boeing Company, The. Simplified method and apparatus for hot-shield jet noise suppression. 4,291,782, Cl. 181-215.000.

Klein, Martin G., to Energy Research Corporation. Battery construction for uniform electrode current density. 4,292,381, Cl. 429-120.000.

Klein, Marvin B.: *See—*
Pepper, David M.; and Klein, Marvin B., 4,291,950, Cl. 350-389.000.

Kleinschmidt, Peter; Meixner, Hans; and Magori, Valentin, to Siemens Aktiengesellschaft. Electronic calcification indicator for flow heaters heated by PTC resistors. 4,292,499, Cl. 219-308.000.

Klemeshov, Georgy A.: *See—*
Korytov, Vladimir A.; Maljushevsky, Pavel P.; Guly, Grigory A.; Shkatov, Alexandr S.; Sladkoshteev, Vladimir T.; Patanin, Ruslan V.; Dorokhov, Vasily I.; Klemeshov, Georgy A.; and Arkulis, Grigory E., 4,291,742, Cl. 164-501.000.

Kleven, Lowell A.: *See—*
Werner, Frank D.; Kleven, Lowell A.; and Greig, Richard C., 4,291,684, Cl. 126-450.000.

Klockner-Humboldt-Deutz AG: *See—*
Weigel, Horst; and Lema-Patino, Jorge, 4,292,283, Cl. 423-107.000.

Klockner-Humboldt-Deutz AG-Zweigniederlassurg FAHR: *See—*
Haake, Hinrich, 4,291,521, Cl. 56-13.500.

Kloss, Wolfgang; and Sauer, Hans, to Varta Batterie Aktiengesellschaft. Housing for instruments powered by ambient oxygen elements. 4,292,681, Cl. 368-280.000.

Klotz, Marvin R., to Standard Oil Company (Indiana). Alkylation of aromatic hydrocarbons. 4,292,457, Cl. 585-447.000.

Klotz, Marvin R., to Standard Oil Company (Indiana). Production of hydrocarbons from alcohols. 4,292,458, Cl. 585-469.000.

Knablein, David J.; and Rees, Chandler D. Indoor greenhouse. 4,291,494, Cl. 47-17.000.

Knarr, John E.: *See—*
Clyne, Arthur J.; Knarr, John E.; and Miller, Stanley, 4,291,750, Cl. 165-34.000.

Kneip, George D., Jr.; and Anderson, Marvin H., to Varian Associates, Inc. Cryostat with external refrigerator for super-conducting NMR spectrometer. 4,291,541, Cl. 62-45.000.

Kniepkamp, Hermann: *See—*
Kellner, Walter; Kniepkamp, Hermann; and Ristow, Dietrich, 4,292,643, Cl. 357-15.000.

Knight, Val F. Traffic marker. 4,292,627, Cl. 340-114.00R.

Knippel, Willis H., to Pullman Incorporated. Railway car side discharge door locking arrangement. 4,291,631, Cl. 105-252.000.

Knowlton, Lloyd L. Carburetor and valving therefor. 4,292,257, Cl. 261-37.000.

Knox, Lloyd C., to Halliburton Company. Platform leg plug. 4,292,004, Cl. 405-203.000.

Ko, William L., to United States of America, National Aeronautics and Space Administration. Superplastically formed diffusion bonded metallic structure. 4,292,375, Cl. 428-593.000.

Kobayashi, Takashi: *See—*
Kondo, Koichi; Yoshida, Isamu; and Kobayashi, Takashi, 4,292,038, Cl. 23-230.00B.

Kobayashi, Yuochi; and Kamiyama, Shinichi, to Ricoh Co., Ltd. Developing apparatus in a magnification-variable copier. 4,291,643, Cl. 118-669.000.

Kobe, Inc.: *See—*
Erickson, John W., 4,292,011, Cl. 417-53.000.

Kobe Steel, Limited: *See—*
Kawaguchi, Yosiyuki; Nishida, Takashi; Marukawa, Nobuaki; Tanaka, Tadakazu; and Kontani, Yoshinari, 4,291,600, Cl. 82-1.00C.
Saito, Takashi; Otake, Katuhiko; and Maruyama, Tokuji, 4,292,495, Cl. 219-125.120.
Tanaka, Takehiko; and Kanzawa, Masahide, 4,291,888, Cl. 277-65.000.

Koch, Klaus: *See—*
Kaiser, Fritz; Koch, Klaus; Schaumann, Wolfgang; and Voigtlander, Wolfgang, 4,292,314, Cl. 424-182.000.

Koch, Otto E., to Fiat-Allis Construction Machinery, Inc. Adjustable steering wheel and control lever console. 4,291,896, Cl. 280-775.000.

Kochi, Hiromu: *See—*
Kishimoto, Teiji; Kochi, Hiromu; and Kaneda, Yoshiyuki, 4,292,320, Cl. 424-258.000.

Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; Kitahara, Tohru; and Watanabe, Kenichi, to Chisso Corporation. Method for producing 3-chloropropyltrichlorosilane. 4,292,433, Cl. 556-479.000.

Koga, Keiichiro: *See—*
Morokawa, Shigeru; Sekiya, Fukuo; Hashimoto, Yukio; Nomura, Yasushi; and Koga, Keiichiro, 4,292,680, Cl. 368-187.000.

Kohler, Robert: *See—*
Wohrle, Rudolf; and Kohler, Robert, 4,291,895, Cl. 280-723.000.

Kohonen, Raimo: *See—*
Lintunen, Tuomo; and Kohonen, Raimo, 4,292,123, Cl. 162-60.000.

Kojima, Hiroshi; Ito, Kunio; Akiyama, Masami; and Tanaka, Takeshi, to Konishiroku Photo Industry Co., Ltd. Process for preparing photosensitive plates for printing. 4,292,389, Cl. 430-169.000.

Kojima, Minoru: *See—*
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.

Kokelenberg, Hendrik E.: *See—*
Pollet, Robert J.; Kokelenberg, Hendrik E.; Samijn, Rafael P.; Sels, Francis J.; Ville, Frans J.; and de Jaeger, Nikolaas C., 4,292,402, Cl. 430-631.000.

Kolb, Gustav; and Bardenheuer, Friedrich, to Mannesmann Aktiengesellschaft; and Kolb, Gustav. Device for sampling molten steel. 4,291,585, Cl. 73-863.230.

Kolc, Ronald F., to RCA Corporation. Nozzle for dispensing viscous fluid. 4,291,642, Cl. 118-415.000.

Kolesnik, Mikhail I.; Egorov, Anatoly P.; Kuznetsov, Anatoly A.; Gobov, Anatoly P.; Ryabukhin, Jury M.; Rudakov, Viktor A.; Pisarev, Gennady V.; Zheleznov, Jury M.; and Vasiliev, Alexei V. Method of protecting carbon-containing component parts of metallurgical units from oxidation. 4,292,345, Cl. 427-113.000.

Koller, Josef. Automatically releasing mounting system for a weight member. 4,291,485, Cl. 43-43.120.

Kollonitsch, Janos: *See—*
Marburg, Stephen; and Kollonitsch, Janos, 4,292,427, Cl. 544-021.000.

Kolmann, Ewald, to Siemens Aktiengesellschaft. Optoelectronic coupling device for transmitting DC signals. 4,292,551, Cl. 307-311.000.

Kolomayets, George: *See*—
Dennis, James T.; and Kolomayets, George, 4,291,886, Cl. 369-203.000.

Kominami, Yasuo: *See*—
Wada, Takeshi; Ienaka, Masanori; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,292,549, Cl. 307-247.00R.

Komiyama, Yoshiro; Kondo, Katsumi; Fuwa, Yoshio; Matsui, Akira; Miyazaki, Shoji; and Hasegawa, Tokushiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Wear resistant alloy. 4,292,074, Cl. 75-122.000.

Komura, Takeshi: *See*—
Honda, Sinya; Komura, Takeshi; Sugita, Naomi; and Okamoto, Tatuya, 4,292,078, Cl. 75-176.000.

Kondo, Asaji: *See*—
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,292,272, Cl. 422-57.000.

Kondo, Eiji: *See*—
Tanaka, Kentaro; Shoji, Jun'ichi; Kawamura, Yoshimi; Hattori, Teruo; Kondo, Eiji; Matsumoto, Kouichi; Yoshida, Tadashi; and Tsuji, Naoki, 4,292,241, Cl. 260-245.20T.

Kondo, Katsumi: *See*—
Komiyama, Yoshiro; Kondo, Katsumi; Fuwa, Yoshio; Matsui, Akira; Miyazaki, Shoji; and Hasegawa, Tokushiro, 4,292,074, Cl. 75-122.000.

Kondo, Koichi; Yoshida, Isamu; and Kobayashi, Takashi, to Takeda Chemical Industries, Ltd. Formamide-containing latex agglutinating reagent for immunoassay. 4,292,038, Cl. 23-230.00B.

Kondo, Mikio; Inoue, Hiromitsu; and Ohashi, Hiroshi, to Matsushita Electric Works, Ltd. Variable directivity mounting means. 4,292,679, Cl. 367-188.000.

Kondo, Shiro; and Akazawa, Michitada, to Alps Electric Co., Ltd. Lever switch with improved actuating member. 4,292,485, Cl. 200-332.000.

Konigs, Heinz: *See*—
Kremer, Hubert; Konigs, Heinz; and Gutmann, Otto, 4,291,730, Cl. 139-65.000.

Konishi, Motofumi: *See*—
Yanagawa, Hitoshi; Konishi, Motofumi; Ando, Yoshio; and Kashiwagi, Kazuo, 4,291,843, Cl. 242-57.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kojima, Hiroshi; Ito, Kunio; Akiyama, Masami; and Tanaka, Takeshi, 4,292,389, Cl. 430-169.000.

Kono, Shinichi: *See*—
Watanabe, Tadahiko; and Kono, Shinichi, 4,292,081, Cl. 501-96.000.

Kontani, Yoshinari: *See*—
Kawaguchi, Yosiyuki; Nishida, Takashi; Marukawa, Nobuaki; Tanaka, Tadakazu; and Kontani, Yoshinari, 4,291,600, Cl. 82-1.00C.

Konter, Kenneth D.: *See*—
Huddleston, George R., Jr.; Turner, James W.; and Konter, Kenneth D., 4,292,424, Cl. 528-500.000.

Korber, Hermann, to Balda-Werke. Electronic flasher. 4,291,963, Cl. 354-128.000.

Korea Institute of Science and Technology: *See*—
Kim, Choong S.; Lee, Kee J.; Kim, Hong S.; and Chae, Yung B., 4,292,431, Cl. 548-342.000.

Korobeinik, Vladimir F.: *See*—
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A., 4,292,494, Cl. 219-76.130.

Korytov, Vladimir A.; Maljushevsky, Pavel P.; Guly, Grigory A.; Shkatov, Alexandr S.; Sladkoshteev, Vladimir T.; Patanin, Ruslan V.; Dorokhov, Vasily I.; Klemeshov, Georgy A.; and Arkulis, Grigory E. Method and apparatus for obtaining an ingot. 4,291,742, Cl. 164-501.000.

Kossuth, Gabor: *See*—
Morse, Calvin J.; and Kossuth, Gabor, 4,291,754, Cl. 165-165.000.

Koster, Hendrikus J.; Bik, Johannes T. J.; Clardey, Johannes G.; and Smorenberg, Dirk, to Sigarettenfabriek Ed. Laurens B.V. Cigarette filter and filter cigarette. 4,291,712, Cl. 131-339.000.

Kostjunin, Boris N.: *See*—
Sanin, Sergei A.; Ponomarenko, Jury F.; Firstov, Vladislav D.; Khorin, Vladimir N.; Ragutsky, Arnold M.; Kostjunin, Boris N.; and Bronfen, Petr M., 4,291,718, Cl. 137-87.000.

Kotalik, Richard J.: *See*—
Goodwin, Perry H., Jr.; and Kotalik, Richard J., 4,292,633, Cl. 340-870.390.

Kotani, Teizo; Arai, Kozo; Fukui, Shiomi; and Nagata, Masaki, to Japan Synthetic Rubber Company Limited. Pressure sensitive conductor and method of manufacturing the same. 4,292,261, Cl. 264-24.000.

Kothmann, Richard E., to Westinghouse Electric Corp. Variable area fuel cell process channels. 4,292,379, Cl. 429-17.000.

Kovach, Julius L. By-pass proof adsorber cell. 4,292,059, Cl. 55-350.000.

Kovacic, Thomas: *See*—
Hansen, Robert N., 4,291,893, Cl. 280-507.000.

Kowal, Leonard, to Ampex Corporation. Color corrector for a composite color video signal. 4,292,648, Cl. 358-8.000.

Kowalski, Jerome R., to Mohasco, Corp. Manually-operated reclining chairs. 4,291,913, Cl. 297-89.000.

Kozlov, Anatoly E.: *See*—
Dudko, Daniil A.; Mozzhukhin, Anatoly A.; Breze, Vladimir V.; Kozlov, Anatoly E.; Grigoriev, Veniamin G.; Sotchenko, Vladimir P.; Maximovich, Boleslav I.; Budzan, Bogdan P.; and Zavodian, Vitaly V., 4,292,486, Cl. 219-9.500.

Kraft, Thomas L.; Vick, Howard A.; and Meador, James W., to American Home Products Corporation. Photometric apparatus and method. 4,291,983, Cl. 356-338.000.

Kraftwerk Union AG: *See*—
Diegel, Dieter; and Borgmann, Heinz-Alfred, 4,292,534, Cl. 290-40.00R.

Kraftwerk Union Aktiengesellschaft: *See*—
Figlhuber, Dietgar; Gallwas, Johannes; Weber, Robert; and Weber, Jakob, 4,291,579, Cl. 73-636.000.

Kramm, Carl H., to RLK Research, Inc. Hone stone with compressible ends. 4,291,506, Cl. 51-338.000.

Krappmann, Franz: *See*—
Stahl, Werner; Breuer, Uwe; Richter, Bernhard; Alstetter, Franz; Krappmann, Franz; and Schuster, Hans, 4,292,177, Cl. 210-325.000.

Krause, William A.; and Langeland, Leonard E., to Omnipure, Inc. Compact electrocatalytic sewage treatment unit for maritime use. 4,292,175, Cl. 210-192.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Stahl, Werner; Breuer, Uwe; Richter, Bernhard; Alstetter, Franz; Krappmann, Franz; and Schuster, Hans, 4,292,177, Cl. 210-325.000.

Krell, Robert D.: *See*—
Ali, Fadia E.; Krell, Robert D.; and Snader, Kenneth M., 4,292,305, Cl. 424-45.000.

Kremer, Hubert; Konigs, Heinz; and Gutmann, Otto, to Maschinenfabrik Carl Sangs Aktiengesellschaft. Double-lift open-shed jacquard machine. 4,291,730, Cl. 139-65.000.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Polyfluoroallyloxy compounds, their preparation and copolymers therefrom. 4,292,449, Cl. 568-649.000.

Kretz, Francis; and Boudeville, Jean-Louis. Expansion and compression of television signals by use of differential coding. 4,292,651, Cl. 358-135.000.

Krigbaum, Ronald S.: *See*—
Gore, Donald B.; Krigbaum, Ronald S.; and Peterson, James O., 4,292,215, Cl. 260-17.300.

Krone, Keith: *See*—
Hansen, Robert N., 4,291,893, Cl. 280-507.000.

Krone, William: *See*—
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Kruckenberg, Winfried; and Schundehutte, Karl H., to Bayer Aktiengesellschaft. Benzisothiazole azo dyestuffs containing polyether groups. 4,292,239, Cl. 260-158.000.

Krueger, Hans: *See*—
Cirkler, Werner; and Krueger, Hans, 4,291,947, Cl. 350-336.000.

Kruehler, Wolfgang: *See*—
Plaettner, Rolf; Kruehler, Wolfgang; and Grabmaier, Josef, 4,292,343, Cl. 427-39.000.

Krumpelt, Michael; and Bates, John K., to United States of America, Energy. Thermal regeneration of an electrochemical concentration cell. 4,292,378, Cl. 429-15.000.

Krupenik, Vitaly N.: *See*—
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A., 4,292,494, Cl. 219-76.130.

Kruse, Walter M.: *See*—
deBerardinis, Albert J.; and Kruse, Walter M., 4,292,451, Cl. 568-863.000.

Kubitza, Werner; Mennicken, Gerhard; and Pedain, Josef, to Bayer Aktiengesellschaft. Isocyanate mixture and its use as binder in one-component lacquers. 4,292,350, Cl. 427-385.500.

Kubota Ltd.: *See*—
Kawasaki, Masami; and Sadakane, Hirofumi, 4,291,522, Cl. 56-15.800.

Kudelko, Arthur G.: *See*—
McMurray, John C.; and Kudelko, Arthur G., 4,291,737, Cl. 411-282.000.

Kudo, Daijiro; and Ikeda, Kiyoshi, to Fujitsu Limited. Method for processing substrate materials by means of plasma treatment. 4,292,153, Cl. 204-164.000.

Kuge, Tsukasa: *See*—
Taniishi, Shinnosuke; and Kuge, Tsukasa, 4,291,505, Cl. 51-289.00R.

Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Alkylation of benzthiazole-azo-phenylamine dyestuffs. 4,292,238, Cl. 260-158.000.

Kuhn, Eberhard: *See*—
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, 4,292,398, Cl. 430-306.000.

Kuhn, Michael H.; and Tomaschewski, Horst, to U.S. Philips Corporation. Method of verifying a speaker. 4,292,471, Cl. 179-1.05B.

Kuhnert, Volker; and Wilhelm, Dieter, to U.S. Philips Corporation. Lamp/reflector unit. 4,292,564, Cl. 313-318.000.

Kuhnlein, Hans; Gruntleitner, Hans; and Ebert, Hermann, to Siemens Aktiengesellschaft. Control signal transmitter for the commutating

device of an electronically commutated d-c motor. 4,292,575, Cl. 318-254.000.

Kuhnlein, Hans: *See—*
Ebert, Hermann; Gruntleitner, Johann; and Kuhnlein, Hans, 4,292,573, Cl. 318-138.000.

Kumagai, Yuzo, to Bridgestone Tire Company Limited. Tire building drum. 4,292,112, Cl. 156-415.000.

Kund, August, to Communications Technology Corp. Crimp type cable shield bonding device. 4,291,934, Cl. 339-95.00R.

Kunst, Helmut; and Scondo, Christian, to Degussa Aktiengesellschaft. Process for increasing the corrosion resistance of nitrided structural parts made of iron material. 4,292,094, Cl. 148-6.110.

Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., to Olin Corporation. Cell having in situ reduction of electrode overvoltage. 4,292,159, Cl. 204-237.000.

Kupper, Walter; and Utzinger, Diethelm, to Mettler Instrumente AG. Scale with cantilever beam strain measurement. 4,291,776, Cl. 177-229.000.

Kurihara, Kunitoshi: *See—*
Takeda, Renzo; Kurihara, Kunitoshi; and Uchikawa, Sadao, 4,292,128, Cl. 176-20.00R.

Kuriloff, Fredric M.: *See—*
Ensmann, Burt W.; Kuriloff, Fredric M.; and Rosenhagen, William, 4,291,877, Cl. 273-86.00B.

Kusakabe, Hiromi, to Tokyo Shibaura Denki Kabushiki Kaisha. Constant current source. 4,292,584, Cl. 323-316.000.

Kuznetsov, Anatoly A.: *See—*
Kolesnik, Mikhail I.; Egorov, Anatoly P.; Kuznetsov, Anatoly A.; Gobov, Anatoly P.; Ryabukhin, Jury M.; Rudakov, Viktor A.; Pisarev, Gennady V.; Zheleznov, Jury M.; and Vasiliev, Alexei V., 4,292,345, Cl. 427-113.000.

Kyoshin Co., Ltd.: *See—*
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, 4,292,044, Cl. 44-1.00R.

Kyuchukov, Yanko P.; and Srebrov, Bojidar M., to ZM "Cherno More". Manometer body. 4,291,580, Cl. 73-741.000.

Labavia-S.G.E.: *See—*
Jollois, Jean-Marie, 4,292,556, Cl. 310-93.000.

Laboratorie Roger Bellon: *See—*
Pesson, Marcel, 4,292,317, Cl. 424-250.000.

Lafitte, Andre: *See—*
Gabbay, Emile; Tran Quang, Dang; and Lafitte, Andre, 4,292,563, Cl. 313-56.000.

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Husain, Matloob; Lai, Ban-Yen; and Maher, James B., 4,291,538, Cl. 60-661.000.

Lai, John T.; and Son, Pyong N., to B. F. Goodrich Company, The. 2-Keto-1,4-diazacycloalkanes. 4,292,240, Cl. 260-239.30R.

Laine, Richard M., to SRI International. Production of amines. 4,292,242, Cl. 260-326.800.

Lakeside Bridge & Steel Co.: *See—*
Reckin, George M.; Lofy, Richard A.; and Dean, Robert S., 4,291,500, Cl. 49-68.000.

Lammers, Gerald B.; and Ream, Gregory L., to International Business Machines Corporation. Closed loop compensation of ink jet aerodynamics. 4,292,640, Cl. 346-75.000.

Lamoureux, Paul, to Canadair Limited. Fuel tank access door for aircraft. 4,291,816, Cl. 220-243.000.

Land, Charles M. Air cleaner for fuel injected engines. 4,292,061, Cl. 55-493.000.

Land, Edwin H., to Polaroid Corporation. Strobe switch with camera control feature. 4,291,964, Cl. 354-145.000.

Landgreen, Eleanor A., to International Telephone and Telegraph Corporation. Ground lug for electrical connector. 4,291,930, Cl. 339-14.00P.

Lang, Gusztav; Storck, Friedrich; and Seghezzi, Hans-Dieter, to Hilti Aktiengesellschaft. Expansion dowel. 4,291,608, Cl. 411-16.000.

Langeland, Leonard E.: *See—*
Krause, William A.; and Langeland, Leonard E., 4,292,175, Cl. 210-192.000.

Langer, Alois A.: *See—*
Heilman, Marlin S.; and Langer, Alois A., 4,291,707, Cl. 128-784.000.

Langner, Carl, to Concast Incorporated. Dummy bar for a continuous casting machine. 4,291,748, Cl. 164-426.000.

Lao, Binneg Y., to Bendix Corporation, The. Pressure sensing capacitive transducer. 4,292,659, Cl. 361-283.000.

La Pierre, Rene B.: *See—*
Gorring, Robert L.; and La Pierre, Rene B., 4,292,166, Cl. 208-59.000.

Laria-Laterizi Rivestimenti ed Affini-S.p.A.: *See—*
Mosso, Luigi, 4,292,359, Cl. 428-151.000.

La Rovere, Angelo: *See—*
Piccolo, Luigi; Corsini, Tullio; Paolinelli, Antonio; Ferri, Gaudenzio; and La Rovere, Angelo, 4,292,085, Cl. 106-109.000.

Larsen, Kurt A., to Danfoss A/S. Control apparatus for the low pressure evaporator of a refrigeration plant. 4,291,544, Cl. 62-221.000.

Laska, Ronald C.; and Pone, Janis, to Pako Corporation. Photographic reprint system with large print quantity verification. 4,291,972, Cl. 355-40.000.

Laskaris, Evangelos T., to General Electric Company. Flexible support for superconducting machine rotor. 4,291,997, Cl. 403-24.000.

Lathrops, Donald D. W.: *See—*
Whitman, Archie E., Sr.; and Lathrops, Donald D. W., 4,291,452, Cl. 29-235.000.

Latymer, Zdenek, to Talres Development (N.A.) N.V. Sweetening compositions containing peptide sweeteners and a method for their manufacture. 4,292,336, Cl. 426-548.000.

Laurie, Gordon H.; Seymour, Theodore J.; Sakauye, Randall T.; and Marlow, John V., to Cominco Ltd. Forming expanded mesh sheet from deformable strip. 4,291,443, Cl. 29-6.100.

Layer, Robert W.; and Son, Pyong N., to B. F. Goodrich Company, The. Polymeric ultraviolet light stabilizers containing hindered alkyl amines. 4,292,237, Cl. 260-45.8NW.

Lazarchik, Robert E.; and Roeder, Robert S., to Sperry Corporation. Augmented radiometric system. 4,292,638, Cl. 343-7.500.

Lazarz, Christine A.: *See—*
Chang, Eng-Pi; Lazarz, Christine A.; and Cook, Edward H., Jr., 4,292,146, Cl. 204-98.000.

Lazzarini, Donald J.: *See—*
Kenney, Eugene J.; Lazzarini, Donald J.; and Winters, Robert J., 4,292,230, Cl. 260-33.2EP.

Le Materiel Telephonique Thomson-CSF: *See—*
Chataignon, Andre; Nicolas, Alain; and Poirier, Jean P., 4,292,479, Cl. 179-170.0NC.

Lebedev, Vladimir K.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Sheiko, Pavel P.; and Pashulya, Mikhail P., 4,292,497, Cl. 219-130.510.

Lecerf, Andre; and Broussely, Michel, to Saft Leclanche. Positive active material for an electric cell, a method of preparing the positive active material and a cell which uses it. 4,292,382, Cl. 429-197.000.

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Frank, Lee F.; and Lee, James K., 4,291,958, Cl. 354-25.000.

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De Mattei, Robert C.; Elwell, Dennis; and Feigelson, Robert S., 4,292,145, Cl. 204-60.000.
Michaels, Alan S.; Weiner, Michael W.; and Jalan, Hemant, 4,292,227, Cl. 260-29.60H.

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Barr, Charles W.; Lerer, Michael I.; Sanders, Royden C., Jr.; and Vassar, Russell J., Jr., 4,291,992, Cl. 400-124.000.
Leroux, Adrien, to h.o.p. ConsuLab Inc. Two-stage electric generator system. 4,292,532, Cl. 290-6.000.
Lesk, I. Arnold: *See—*
Sarma, Kalluri R.; Rice, M. John, Jr.; and Lesk, I. Arnold, 4,292,342, Cl. 427-34.000.
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Hooper, David C.; Johnson, George A.; and Peter, Donald, 4,292,192, Cl. 252-132.000.
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Lewakowski, John J.; and Ciagala, Theodore M., to Chrysler Corporation. Method of making L-seal for gas turbine regenerator. 4,291,563, Cl. 72-216.000.
Lewis, John C., Jr., to Tucel Industries, Inc. Tufted angular brush consturction. 4,291,431, Cl. 15-159.00R.
Lewis, Philip J., to Brogdex Company. Drying apparatus for aqueous coated articles and method. 4,291,472, Cl. 34-31.000.
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Lindner, Tassilo; Engelsberger, Georg; Zeller, Norbert; and Riedle, Rudolf, to Wacker-Chemie GmbH. Process for the addition of Si-bonded hydrogen to an aliphatic multiple bond. 4,292,434, Cl. 556-479.000.
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Lingner + Fischer: *See—*
Hechenberger, Dieter A.; and Neye, Angelika, 4,292,229, Cl. 260-30.60R.
Linhardt & Associates, Inc.: *See—*
Linhardt, Hans D.; and Beveridge, John H., 4,292,050, Cl. 55-1.000.
Linhardt, Hans D.; and Beveridge, John H., to Linhardt & Associates, Inc. Curved duct separator for removing particulate matter from a carrier gas. 4,292,050, Cl. 55-1.000.
Lintunen, Tuomo; and Kohonen, Raimo, to Enso-Gutzeit Osakeytio . Procedure and apparatus for cellulose washing. 4,292,123, Cl. 162-60.000.
Lipes, Arnold. Method and apparatus for bag filling, tieing and transfer. 4,291,517, Cl. 53-468.000.
Lippert, Wilmot T. Exercising and method for exercising finger, hand and arm muscles. 4,291,871, Cl. 272-68.000.
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Litton Systems, Inc.: *See—*
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Liu, Thomas M. H.; Reamer, Robert A.; Shinkai, Ichiro; and Sletzinger, Meyer, to Merck & Co., Inc. Process for the preparation of N-protected N-formimidoyl 2-aminoethanethiol. 4,292,436, Cl. 560-148.000.
Livesay, J. D., to General Motors Corporation. Liquid accumulator. 4,291,548, Cl. 62-503.000.
Ljungdahl, Lars G.; and Wiegel, Jurgen K. W., to United States of America, Energy. Anaerobic thermophilic culture system. 4,292,406, Cl. 435-42.000.
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Lobdell, Alban J.; and Rupp, Wiktor J., to Itek Corporation. Teaching device for progressive power lenses. 4,292,030, Cl. 434-262.000.
Locher, Johannes, to Robert Bosch GmbH. Monitor apparatus for electrical circuits with virtual resistance. 4,292,658, Cl. 361-93.000.
Lockheed Corporation: *See—*
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Lough, Lewis E., to United States of America, Army. Infrared aiming light mounting bracket for weapon. 4,291,478, Cl. 42-1.00A.
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Jones, David, 4,291,534, Cl. 60-547.00R.
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Luke, John A., to British-American Tobacco Company Limited. Production of tobacco-smoke filters. 4,292,032, Cl. 493-43.000.
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Lupke, Manfred A. A.; and Lupke, Gerd P. H. Feed mechanism comprising an endless member configured as a double helix. 4,292,014, Cl. 425-72.00R.
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Maddock, Mitchell E. Liquid herbicide applicator. 4,291,491, Cl. 47-1.500.
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Marchioro, Ignazio, to Escher Wyss Limited. Controlled deflection roll. 4,291,447, Cl. 29-116.0AD.
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Marteness, Bruce A., to Minnesota Mining and Manufacturing Company. Fabric-reinforced bonding sheet comprising an epoxy resin and dianiline and use thereof to make an insulated rail joint. 4,292,110, Cl. 156-92.000.
Martin, Charles F. Sheave making apparatus and method. 4,291,559, Cl. 72-84.000.
Martin, Erwin, to Siemens Aktiengesellschaft. Attenuating means for electroacoustic transducer. 4,292,561, Cl. 310-322.000.
Martin, Francis W., to Corning Glass Works. Cesium-stuffed cordierite ceramics. 4,292,080, Cl. 501-4.000.
Martin, Lawrence L.; and Worm, Manfred, to Hoechst Roussel Pharmaceuticals Incorporated. 3''-Phenyldispiro[1,3-dioxolane-2,4'-cyclohexane-1',1''-(3''H)-isobenzofuran]. 4,292,243, Cl. 260-340.90R.
Martin, Lawrence L.; and Worm, Manfred, to Hoechst-Roussel Pharmaceuticals Incorporated. 3'-Phenylspiro[cyclohexane-1,1'(3'H)-isobenzofuran]-4-one. 4,292,245, Cl. 260-346.220.
Martin Marietta Corporation: *See—*
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Mascoli, Carmine C.; Pope, J. Lee, Jr.; and Weber, Phillip L., to Baxter Travenol Laboratories, Inc. Sterility test set. 4,292,405, Cl. 435-31.000.
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Matsui, Akira: *See—*
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Matsumoto, Kouichi: *See*—
Tanaka, Kentaro; Shoji, Jun'ichi; Kawamura, Yoshimi; Hattori, Teruo; Kondo, Eiji; Matsumoto, Kouichi; Yoshida, Tadashi; and Tsuji, Naoki, 4,292,241, Cl. 260-245.20T.

Matsumoto, Shinichi: *See*—
Wakizaka, Hiroshi; Shinohara, Hiroshi; Otsuka, Yasuhiro; and Matsumoto, Shinichi, 4,292,157, Cl. 204-195.00S.

Matsumoto, Takashi; and Nawata, Takahiro, to VLSI Technology Research Association. Method of manufacturing semiconductor devices. 4,292,156, Cl. 204-192.0EC.

Matsuo, Hideo: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Keizo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,291,644, Cl. 118-704.000.

Matsuo, Masanori: *See*—
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; and Furukawa, Yosio, 4,291,926, Cl. 308-73.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,292,610, Cl. 333-222.000.
Niguchi, Hirotoshi; and Ieki, Mitsuru, 4,291,781, Cl. 181-169.000.

Matsushita Electric Works, Ltd.: *See*—
Kondo, Mikio; Inoue, Hiromitsu; and Ohashi, Hiroshi, 4,292,679, Cl. 367-188.000.
Ono, Kenji; Matsushita, Hidetoshi; and Shibata, Minoru, 4,292,614, Cl. 335-202.000.

Matsushita, Hidetoshi: *See*—
Ono, Kenji; Matsushita, Hidetoshi; and Shibata, Minoru, 4,292,614, Cl. 335-202.000.

Matsuya, Kuni: *See*—
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,292,070, Cl. 71-96.000.

Matsuyama, Yoshihiro: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Keizo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,291,644, Cl. 118-704.000.

Mattel, Inc.: *See*—
Bass, Sidney; and Pimentel, Gary W., 4,291,884, Cl. 273-249.000.
Buck, Gordon H.; Gabler, Otto L.; Kilroy, Eugene J.; and Leoncavallo, Richard, 4,291,663, Cl. 124-26.000.

Matysak, Edward A., to Boeing Company, The. Oil metering apparatus for air line lubricators. 4,291,785, Cl. 184-55.00A.

Mauldin, Charles H.; and Baird, William C., Jr., to Exxon Research & Engineering Co. Reforming with multimetallic catalysts. 4,292,204, Cl. 252-439.000.

Maupate, Jacques, to Societe Generale pour l'Emballage. Disappearing grasping head. 4,291,910, Cl. 294-95.000.

Maurer, Helmut; Dillman, Gerhard; Rieger, Franz; and Linder, Ernst, to Robert Bosch GmbH. Method and system for controlling the temperature of a heat measuring sensor especially in motor vehicles. 4,291,572, Cl. 73-23.000.

Maurer, Helmut: *See*—
Muller, Klaus; Maurer, Helmut; Dietz, Hermann; Friese, Karl-Hermann; Leibfried, Wolfgang; Stecher, Gunther; and Linder, Ernst, 4,292,158, Cl. 204-195.00S.

Mauser-Werke Oberndorf GmbH: *See*—
Repa, Otto, 4,291,476, Cl. 42-1.0ST.

Max-Planck-Gesellshaft zur Forderung der Wissenschaften e.V.: *See*—
Hoppe, Walter, 4,292,523, Cl. 250-442.000.

Maximovich, Boleslav I.: *See*—
Dudko, Daniil A.; Mozzhukhin, Anatoly A.; Breze, Vladimir V.; Kozlov, Anatoly E.; Grigoriev, Veniamin G.; Sotchenko, Vladimir P.; Maximovich, Boleslav I.; Budzan, Bogdan P.; and Zavodian, Vitaly V., 4,292,486, Cl. 219-9.500.

Maxwell, Jerrold F.: *See*—
Davis, Pauls; Maxwell, Jerrold F.; and Wilson, Joe C., 4,292,190, Cl. 252-75.000.

Mayer, Francis X.; and Arey, William F., Jr., to Exxon Research & Engineering Co. Magnetically stabilized, fluidized beds. 4,292,171, Cl. 208-164.000.

McAlister, Doyle V.: *See*—
Pfiester, James R.; and McAlister, Doyle V., 4,292,547, Cl. 307-463.000.

McCarthy, Thomas C., Jr., to Hasbro Industries, Inc. Push toy. 4,291,489, Cl. 46-205.000.

McCarty, Lewis V.; and Pugh, John W., to General Electric Company. Process of manufacturing a tungsten lamp filament. 4,291,444, Cl. 29-25.140.

McDonnel Douglas Corporation: *See*—
Walker, James V., 4,291,890, Cl. 277-165.000.

McGregor, Duane F.: *See*—
Harmes, O. Burton; and McGregor, Duane F., 4,291,812, Cl. 211-207.000.

McHale, Edward J., to Union Carbide Corporation. Fluidized bed heating process and apparatus. 4,292,344, Cl. 427-45.100.

McHam, David E. Container for prepackaging, popping and serving popcorn. 4,292,332, Cl. 426-111.000.

McMahon, Donald H., to Sperry Corporation. Digital fiber optic position sensor. 4,291,976, Cl. 356-150.000.

McMurray, John C.; and Kudelko, Arthur G., to Russell, Burdsall and Ward Corporation. Prevailing torque lock nut and method of forming same. 4,291,737, Cl. 411-282.000.

McVey, John K., to Illinois Tool Works Inc. Thermal switch with electrically conductive thermal sensing pellet. 4,292,617, Cl. 337-407.000.

Meador, James W.: *See*—
Kraft, Thomas L.; Vick, Howard A.; and Meador, James W., 4,291,983, Cl. 356-338.000.

Measurematic Development Company: *See*—
Follett, Earl C., 4,291,468, Cl. 33-192.000.

Meckel, Walter: *See*—
Wenzel, Wolfgang; and Meckel, Walter, 4,292,226, Cl. 260-29.2TN.

Medac Gesellschaft fur Klinische Spezialpraparate mbH: *See*—
Reul, Helmut, 4,291,420, Cl. 3-1.500.

Medovar, Boris I.; Artamonov, Viktor L.; Kirsanov, Pavel I.; Marchenko, Alexandr M.; Bogachenko, Alexei G.; Pavlov, Leonid V.; Kamensky, Jury M.; Gutnov, Ruslanbek B.; and Platonov, Pavel M. Apparatus for electroslag remelting of consumable electrodes. 4,291,744, Cl. 164-509.000.

Medtronic, Inc.: *See*—
Athearn, Lee F., 4,292,346, Cl. 427-115.000.

Meetham, Geoffrey W.; and Marjoram, John R., to Rolls-Royce Limited. Cambered blade or vane for a gas turbine engine. 4,292,010, Cl. 416-241.00R.

Mefina S.A.: *See*—
Rosselet, Jean, 4,291,628, Cl. 102-276.000.

Meixner, Hans: *See*—
Kleinschmidt, Peter; Meixner, Hans; and Magori, Valentin, 4,292,499, Cl. 219-308.000.

Melby, Allan L., to Henkel Corporation. Shampoo creme rinse. 4,292,212, Cl. 252-547.000.

Melzer, Erich G., to Deutsch Company Electronic Components Division, The. Optical fiber connector. 4,291,941, Cl. 350-96.180.

Mendelsohn, Marshall H.: *See*—
Ron, Moshe; Gruen, Dieter M.; Mendelsohn, Marshall H.; and Sheft, Irving, 4,292,265, Cl. 264-82.000.

Mennicken, Gerhard: *See*—
Kubitza, Werner; Mennicken, Gerhard; and Pedain, Josef, 4,292,350, Cl. 427-385.500.

Merceron, Daniel: *See*—
Badoz, Jean-Marie; and Merceron, Daniel, 4,291,935, Cl. 339-97.00R.

Merck & Co., Inc.: *See*—
Fullerton, W. Wardle, 4,292,041, Cl. 23-230.300.
Liu, Thomas M. H.; Reamer, Robert A.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,292,436, Cl. 560-148.000.
Marburg, Stephen; and Kollonitsch, Janos, 4,292,427, Cl. 544-021.000.
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., 4,292,430, Cl. 548-206.000.

Meridian Industries Inc.: *See*—
Zylka, Kenneth R.; and Witte, Earl R., 4,292,180, Cl. 210-496.000.

Merlin Gerin S.A.: *See*—
Bresson, Raymond; and Ducluzaux, Andre P., 4,292,611, Cl. 335-6.000.

Merten, Josef: *See*—
Grigo, Ulrich; Morbitzer, Leo; Arlt, Klaus-Peter; Binsack, Rudolf; and Merten, Josef, 4,292,222, Cl. 260-29.1SB.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Weiland, Emil; and Brunsch, Klaus, 4,292,009, Cl. 416-134.00A.

Messier S.A.: *See*—
Girard, Edmond, 4,291,536, Cl. 60-644.000.

Mettler Instrumente AG: *See*—
Kupper, Walter; and Utzinger, Diethelm, 4,291,776, Cl. 177-229.000.

Meyer, Adolf: *See*—
Wesch, Ludwig; and Meyer, Adolf, 4,292,364, Cl. 428-286.000.

Meyer, Delbert H.: *See*—
Lee, Richard J.; Meyer, Delbert H.; and Senneke, Darrell M., 4,292,452, Cl. 568-881.000.

Meyerle, Michael; and Ehrlinger, Friedrich, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Load splitting hydromechanical transmission. 4,291,592, Cl. 74-687.000.

Mialon, Jacques, to Societe Nationale Industrielle Aerospatiale. Process for making a connecting rod for controlling or transmitting efforts, and connecting rod thus obtained. 4,292,368, Cl. 428-310.000.

Michaels, Alan S.; Weiner, Michael W.; and Jalan, Hemant, to Leland Stanford Junior University, Board of Trustees of. Stable supersaturated solutions of sparingly soluble salts. 4,292,227, Cl. 260-29.60H.

Michalowicz, William A., to American Color & Chemical Corporation. Preparation of hydroxyanthraquinones. 4,292,248, Cl. 260-383.000.

Michelson, Anatol. Apparatus and method for heatless production of hollow items, for instance, foundry shell cores. 4,291,740, Cl. 164-7.100.

Midland-Ross Corporation: *See*—
Blickley, Michael; and Naccara, Nicholas G., 4,291,844, Cl. 242-68.200.

Mikofalvy, Bela K.: *See*—
Turner, James W.; and Mikofalvy, Bela K., 4,292,420, Cl. 526-212.000.

Mikuni, Hisao: *See*—
Fujita, Kenji; Shibata, Yuji; Mikuni, Hisao; and Shibuya, Tsuneo, 4,292,137, Cl. 202-248.000.

Milberger, Ernest C.; and Wong, Eunice K. T., to Standard Oil Company, The. Oxidation catalysts. 4,292,203, Cl. 252-438.000.

Miles Laboratories, Inc.: *See*—
Buckler, Robert T.; Burd, John F.; and Wong, Raphael C., 4,292,425, Cl. 536-4.000.

Millard, Gregory S. T.: *See*—
Argyle, Charles S.; Bamsey, Robert C.; and Millard, Gregory S. T., 4,291,760, Cl. 165-166.000.

Miller, Don W.: *See*—
Schlosser, Philip A.; and Miller, Don W., 4,292,645, Cl. 357-29.000.

Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, to A. J. Antunes & Co. Pressurized injection steamer. 4,291,617, Cl. 99-483.000.

Miller, Henry W., to Cameron Iron Works, Inc. Flowline switching apparatus. 4,291,724, Cl. 137-555.000.

Miller, John R., to United States of America, Energy. Methods and apparatus for producing cryogenic inertially driven fusion targets. 4,292,340, Cl. 427-6.000.

Miller, Richard C.; and Schwartz, Bertram, to Bell Telephone Laboratories, Incorporated. Optical monitoring photodiode system. 4,292,512, Cl. 250-205.000.

Miller, Robert C.; Bradley, John J.; King, Richard L.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., to Honeywell Information Systems Inc. Data processing system having data multiplex control bus cycle. 4,292,668, Cl. 364-200.000.

Miller, Stanley: *See*—
Clyne, Arthur J.; Knarr, John E.; and Miller, Stanley, 4,291,750, Cl. 165-34.000.

Milliken Research Corporation: *See*—
Marco, Francis W., 4,291,442, Cl. 28-159.000.

Minami, Yoriteru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Unlocking device for seatbelt system. 4,291,897, Cl. 280-802.000.

Minnesota Mining and Manufacturing Company: *See*—
Binek, Paul H.; Cherney, Thomas M.; Magnusson, John M.; and Cronk, Bryon J., 4,291,943, Cl. 350-96.220.
Hollingsworth, Elmont E., 4,291,957, Cl. 354-14.000.
Kelly, Michael J.; and Youngquist, Robert J., 4,292,684, Cl. 371-38.000.
Marteness, Bruce A., 4,292,110, Cl. 156-92.000.
Nepper, Robert F.; and Peterson, Dennis L., 4,292,530, Cl. 250-577.000.
Riedel, John E.; and Cheney, Paul G., 4,292,360, Cl. 428-171.000.
Vogelgesang, Peter J., 4,291,956, Cl. 354-14.000.

Minolta Camera Kabushiki Kaisha: *See*—
Yuasa, Yoshio; Ishikawa, Norio; and Taniguchi, Nobuyuki, 4,291,979, Cl. 356-218.000.

Minto, Wallace L., to Sun Power Systems Inc. Method and apparatus for accumulating, storing and releasing thermal energy. 4,291,755, Cl. 165-3.000.

Mionet, Hubert: *See*—
David, Jacques; and Mionet, Hubert, 4,292,594, Cl. 329-50.000.

Mirowski, Mieczyslaw: *See*—
Heilman, Marlin S.; and Langer, Alois A., 4,291,707, Cl. 128-784.000.

Misage, Robert J.: *See*—
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Mitchell Energy Corporation: *See*—
Gilchrist, Ralph E.; Hover, George W.; and Barber, Robert M., 4,291,765, Cl. 166-273.000.

Mitchell, Thomas O.: *See*—
Derbyshire, Francis J.; Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,292,168, Cl. 208-107.000.

Mitsubishi Chemical Industries Ltd.: *See*—
Tsunoda, Yoshitoshi; Tomita, Shimpei; and Miyazawa, Chihiro, 4,292,448, Cl. 568-456.000.
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,292,070, Cl. 71-96.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujii, Masao; Ogawa, Yoshifusa; and Morihiro, Yoshiyuki, 4,291,758, Cl. 165-133.000.
Ida, Yoshiaki; Fukuda, Shiro; and Imamura, Osayoshi, 4,291,989, Cl. 356-440.000.
Tanaka, Yutaka; and Yatomi, Takeshi, 4,292,491, Cl. 219-69.00W.

Mitsubishi Rayon Co., Ltd.: *See*—
Kamada, Kazumasa; and Okada, Kazuya, 4,292,419, Cl. 526-192.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Uemoto, Yasuo; Togami, Shigenori; Takano, Tsumoru, deceased; Ono, Ichiro; and Kayama, Takashi, 4,292,235, Cl. 260-42.180.

Mitsuya, Kinpei: *See*—
Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,291,528, Cl. 57-58.950.

Miu, Ming T.: *See*—
Miller, Robert C.; Bradley, John J.; King, Richard L.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,292,668, Cl. 364-200.000.

Miura, Norio: *See*—
Tanaka, Michio; Miura, Norio; and Shimiya, Keiji, 4,292,107, Cl. 156-249.000.

Miyagawa, Yoshihisa, to Iwatani Sangyo Kabushiki Kaisha. Gas lighter. 4,292,021, Cl. 431-13.000.

Miyagi, Hideo; and Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of controlling the rotational speed of an internal combustion engine. 4,291,656, Cl. 123-320.000.

Miyake, Yasuhiko: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Keizo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,291,644, Cl. 118-704.000.

Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Mounting of fiber supply channel defining means in spinning units of an open end spinning machine. 4,291,528, Cl. 57-58.950.

Miyamoto, Noriaki: *See*—
Seiki, Kazuo; and Miyamoto, Noriaki, 4,291,438, Cl. 19-112.000.

Miyamoto, Yukihiko: *See*—
Wada, Takeshi; Ienaka, Masanori; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,292,549, Cl. 307-247.00R.

Miyashiro, David J. Back and spine exerciser. 4,291,686, Cl. 128-52.000.

Miyazaki, Shoji: *See*—
Komiyama, Yoshiro; Kondo, Katsumi; Fuwa, Yoshio; Matsui, Akira; Miyazaki, Shoji; and Hasegawa, Tokushiro, 4,292,074, Cl. 75-122.000.

Miyazawa, Chihiro: *See*—
Tsunoda, Yoshitoshi; Tomita, Shimpei; and Miyazawa, Chihiro, 4,292,448, Cl. 568-456.000.

Mizelle, Ned W., to Hoover Universal, Inc. Adjustable seat hinge. 4,291,914, Cl. 297-361.000.

Mizusaki, Yoshinobu, to Nisshin Kogyo Kabushiki Kaisha. Mechanism for mounting side mirrors to the master cylinder for motor bicycles. 4,291,590, Cl. 74-551.800.

Mobil Oil Corporation: *See*—
Bonacci, John C.; and Patterson, John R., 4,292,167, Cl. 208-66.000.
Bowes, Emmerson, 4,292,205, Cl. 252-455.00Z.
Chibnik, Sheldon; Otto, Ferdinand P., deceased; and Otto, Helen F., executrix, 4,292,186, Cl. 252-49.700.
Derbyshire, Francis J.; and Whitehurst, Darrell D., 4,292,164, Cl. 208-8.0LE.
Derbyshire, Francis J.; Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,292,168, Cl. 208-107.000.
Gorring, Robert L.; and La Pierre, Rene B., 4,292,166, Cl. 208-59.000.
Piotrowski, Alfred B., 4,292,046, Cl. 44-63.000.
Spencer, Arthur T., 4,292,217, Cl. 260-18.00N.

Mochida, Yutaka: *See*—
Ito, Yasuro; Higuchi, Yoshiro; Mochida, Yutaka; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,292,351, Cl. 427-403.000.

Modicon Div. Gou'd Inc.: *See*—
Hill, Lawrence W.; Stoodley III, Thomas J.; and Malcolm, Ronald, 4,292,666, Cl. 364-104.000.

Moeller, Erwin W. Griddle ventilating system. 4,291,668, Cl. 126-41.00R.

Mogk, Robert D.: *See*—
Fox, Robert M.; Mogk, Robert D.; and Priebe, Edward T., 4,291,912, Cl. 296-217.000.

Mohasco, Corp.: *See*—
Kowalski, Jerome R., 4,291,913, Cl. 297-89.000.

Molle, Egon; and Rosch, Fritz, to Alcan Aluminiumwerk Nurnberg GmbH. Piston and process for its manufacture. 4,291,614, Cl. 92-187.000.

Molyneaux, Isaac. Recycling exhaust fumes valve. 4,291,660, Cl. 123-568.000.

Monash University: *See*—
Potter, Owen E., 4,291,539, Cl. 60-670.000.

Monk, Robert J. Solar energy collector. 4,291,677, Cl. 126-438.000.

Monsanto Company: *See*—
Daniels, Robert J., 4,292,040, Cl. 23-230.00R.

Monson, Eugene. Apparatus for sprouting seeds. 4,291,493, Cl. 47-14.000.

Montavon, Marc; and Reiner, Roland, to Hoffmann-La Roche Inc. Cephalosporin derivatives. 4,292,428, Cl. 544-27.000.

Monte, Woodrow S. Foot support crutch. 4,291,715, Cl. 135-68.000.

Mookherjee, Braja D.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,292,447, Cl. 568-378.000.

Moran, George A.: *See*—
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Morbitzer, Leo: *See*—
Grigo, Ulrich; Morbitzer, Leo; Arlt, Klaus-Peter; Binsack, Rudolf; and Merten, Josef, 4,292,222, Cl. 260-29.1SB.

Moren, Nils F. E.: *See*—
Jonsson, Karl E.; and Moren, Nils F. E., 4,292,324, Cl. 424-289.000.

Mori, Kazuo: *See*—
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Mori, Takehiko; and Mori, Kazuo. Filtering apparatus. 4,292,178, Cl. 210-352.000.

Morihiro, Yoshiyuki: *See*—
Fujii, Masao; Ogawa, Yoshifusa; and Morihiro, Yoshiyuki, 4,291,758, Cl. 165-133.000.

Morinaga, Tsuto: *See*—
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Morlock Corporation: *See*—
Heckrotte, John R., Sr., 4,291,599, Cl. 81-444.000.

Morokawa, Shigeru; Sekiya, Fukuo; Hashimoto, Yukio; Nomura, Yasushi; and Koga, Keiichiro, to Citizen Watch Company Limited. Electronic timepiece. 4,292,680, Cl. 368-187.000.

Morrell, Wilfred L.; and Levine, William M., to OKI Electronics of America, Inc. Electronic key telephone system with bi-directional serial data stream station control. 4,292,474, Cl. 179-99.00M.

Morris, John C.: *See*—
Ginn, Le Roy D.; Ginn, Le Royce S.; Morris, John C.; and Travaglio, Dalny, 4,291,832, Cl. 236-49.000.

Morris, Roger E., to B. F. Goodrich Company, The. Non-fugitive antioxidants. 4,292,195, Cl. 252-401.000.
Morrison, John M.: *See*—
Longmuir, Donald A.; and Morrison, John M., 4,292,586, Cl. 324-73.00R.
Morrissy, Joseph H.: *See*—
Crossland, William A.; Morrissy, Joseph H.; and Coates, David, 4,291,948, Cl. 350-340.000.
Morsdorf, Wolfram W.: *See*—
Wolfsgruber, Friedrich; Kasel, Hans W.; Odendahl, Manfred H. A.; and Morsdorf, Wolfram W., 4,292,075, Cl. 75-130.00R.
Morse, Calvin J.; and Kossuth, Gabor, to Garrett Corporation, The. Thermal management of heat exchanger structure. 4,291,754, Cl. 165-165.000.
Moses, Owen L. Compact, quick assembly scaffold. 4,291,784, Cl. 182-178.000.
Moshier, William A.: *See*—
Wilson, John F.; Hoover, Edward D.; Hammond, Philip K.; Moshier, William A.; Woodell, Jack L.; Spaniol, John W.; Bowerman, John J.; Bieber, Larry C.; and Perlman, Marvin, 4,292,465, Cl. 178-3.000.
Mosso, Luigi, to Laria-Laterizi Rivestimenti ed Affini-S.p.A. Process for the continuous production of a partly finished clay product. 4,292,359, Cl. 428-151.000.
Motorola, Inc.: *See*—
Cota, Marlo E.; and Gurtler, Richard W., 4,292,264, Cl. 264-81.000.
Feder, Alvin, 4,292,562, Cl. 310-348.000.
Pfiester, James R.; and McAlister, Doyle V., 4,292,547, Cl. 307-463.000.
Sarma, Kalluri R.; Rice, M. John, Jr.; and Lesk, I. Arnold, 4,292,342, Cl. 427-34.000.
Schoemer, Hans L., 4,291,475, Cl. 40-338.000.
Moulding, Trevor L. J.: *See*—
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Moynihan, Robert E., to Du Pont de Nemours, E. I., and Company. Polyvinylbutyral sheeting. 4,292,372, Cl. 428-437.000.
Mozzhukhin, Anatoly A.: *See*—
Dudko, Daniil A.; Mozzhukhin, Anatoly A.; Breze, Vladimir V.; Kozlov, Anatoly E.; Grigoriev, Veniamin G.; Sotchenko, Vladimir P.; Maximovich, Boleslav I.; Budzan, Bogdan P.; and Zavodian, Vitaly V., 4,292,486, Cl. 219-9.500.
Muckli, Heinz, to Schloemann-Siemag Aktiengesellschaft. Method of and apparatus for rolling sheet steel profiles of different cross-sectional shape in universal beam rolling mill trains. 4,291,564, Cl. 72-234.000.
Mulleneers, Jan J. M.: *See*—
Albrecht, Cornelius B. J. d.; and Mulleneers, Jan J. M., 4,292,524, Cl. 250-445.00T.
Muller, Erich. Foam fire extinguishing unit for rescue vehicle. 4,291,769, Cl. 169-13.000.
Muller, Hans-Friedrich: *See*—
Fuchs, Heinz, deceased; Muller, Hans-Friedrich; and Hecht, Hildegard, 4,291,698, Cl. 128-335.000.
Muller, Hans-Otto: *See*—
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Muller, Johann: *See*—
Kaufmann, Rudolf; Muller, Johann; and Wegehaupt, Karl-Heinrich, 4,292,423, Cl. 528-18.000.
Muller, Klaus; Maurer, Helmut; Dietz, Hermann; Friese, Karl-Hermann; Leibfried, Wolfgang; Stecher, Gunther; and Linder, Ernst, to Robert Bosch GmbH. Oxygen sensor of the polarographic type, particularly for use with internal combustion engines. 4,292,158, Cl. 204-195.00S.
Mullins, Keith M.: *See*—
Kerr, Ronald R.; Mullins, Keith M.; and Bowie, Bruce H., 4,292,629, Cl. 340-547.000.
Mulroy, Terence J., to Champion International Corporation. Carton with self-locking end closure and blank for forming same. 4,291,827, Cl. 229-39.00R.
Multi Products Co.: *See*—
Watson, Willie L., 4,291,761, Cl. 166-66.000.
Murakami, Hiroyasu: *See*—
Ito, Tadashi; Murakami, Hiroyasu; Suzuki, Masayuki; Yamamichi, Masayoshi; Sakurada, Nobuaki; and Shinoda, Nobuhiko, 4,291,960, Cl. 354-53.000.
Murakami, Kyoichi: *See*—
Niimura, Tsutomu; Murakami, Kyoichi; and Yamakoshi, Akira, 4,292,597, Cl. 330-254.000.
Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, to Nippon Paint Co., Ltd. Phosphating process of metal surface. 4,292,096, Cl. 148-6.15Z.
Muramoto, Hisao, to Toyo Kogyo Co., Ltd. Vehicle occupant restraining safety apparatus. 4,291,899, Cl. 280-806.000.
Muramoto, Takayoshi; and Orita, Kunitaka, to Fumakilla Limited. Method for killing insects with electro-mechanical ultrasonic nebulizer. 4,292,322, Cl. 424-274.000.
Murata Manufacturing Co., Ltd.: *See*—
Tatsumi, Tetsuo, 4,292,660, Cl. 361-293.000.
Murayama, Kashiwa, to Japan Crown Cork Co., Ltd. Easily openable container closure having a shell and a sealing member, apparatus for producing the same. 4,291,567, Cl. 72-347.000.
Muroi, Masayuki: *See*—
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,292,309, Cl. 424-119.000.
Musgrave, Daniel D. Interacting leaf springs. 4,291,480, Cl. 42-50.000.
Musgrave, Daniel D. Cartridge receptacle. 4,291,483, Cl. 42-87.000.
Mutsaers, Cornelis A. H. A.; and Boonstra, Alexander H., to U.S. Philips Corporation. Resistance material. 4,292,619, Cl. 338-308.000.
Myers, Daryl L.: *See*—
Dalrymple, Philip W.; Hyle, Michael J.; Myers, Daryl L.; and Wright, James G., Jr., 4,291,841, Cl. 242-18.00A.
Naccara, Nicholas G.: *See*—
Blickley, Michael; and Naccara, Nicholas G., 4,291,844, Cl. 242-68.200.
Nacci, George R., to Du Pont de Nemours, E. I., and Company. Process of forming a magnetic toner resist using a transfer film. 4,292,120, Cl. 156-660.000.
Nadkarni, Vikas M.: *See*—
Kane, John L.; and Nadkarni, Vikas M., 4,292,365, Cl. 428-288.000.
Nagata, Masaki: *See*—
Kotani, Teizo; Arai, Kozo; Fukui, Shiomi; and Nagata, Masaki, 4,292,261, Cl. 264-24.000.
Nagata, Takeo: *See*—
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nishihara, Motohisa; and Nagata, Takeo, 4,292,618, Cl. 338-5.000.
Nagato, Nobuo, to Ohkuma Seisakusho Co., Ltd. Ball hitting game. 4,291,879, Cl. 273-119.00R.
Nagel, Dietmar; and Kennedy, Melvin. Starting gate for a multiple-track toy vehicle racing set. 4,291,878, Cl. 273-86.00R.
Nakahara, Kazumi, to NGK Spark Plug Co. Ltd. Assembly of piezoelectric element unit and sheet metal mount for ignition device. 4,291,626, Cl. 102-200.000.
Nakamura, Koyo: *See*—
Masaki, Kenji; and Nakamura, Koyo, 4,291,658, Cl. 123-440.000.
Nakamura, Nobuyuki: *See*—
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, 4,292,044, Cl. 44-1.00R.
Nakamura, Norihiko; Nakanishi, Kiyoshi; and Kato, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine equipped with an auxiliary combustion chamber. 4,291,662, Cl. 123-661.000.
Nakanishi, Kiyoshi: *See*—
Nakamura, Norihiko; Nakanishi, Kiyoshi; and Kato, Takashi, 4,291,662, Cl. 123-661.000.
Nakano, Jiro: *See*—
Miyagi, Hideo; and Nakano, Jiro, 4,291,656, Cl. 123-320.000.
Nakao, Masaaki; and Shiiki, Zenya, to Taiyo Kaken Company, Ltd. Method for removing compounds with offensive odor from a gas containing the same. 4,292,285, Cl. 423-210.000.
Nakao, Sho: *See*—
Ikeda, Tomoaki; Shinozaki, Fumiaki; and Nakao, Sho, 4,292,392, Cl. 430-271.000.
Nakao, Toshihiro: *See*—
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,292,509, Cl. 235-92.0MP.
Nakayama, Yoshihiko: *See*—
Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, 4,291,587, Cl. 74-363.000.
Nakazato, Yoshio; Tanaka, Tomoo; Hashiguchi, Koichi; and Soeda, Naohiko, to Kawasaki Steel Corporation. High tensile strength steel sheets having high press-formability and a process for producing the same. 4,292,097, Cl. 148-12.00C.
Nalco Chemical Company: *See*—
Johnson, Donald A.; and Nimry, Baker N., 4,292,293, Cl. 423-571.000.
Namura, Shigekazu; and Sumi, Takao, to Nissha Printing Co., Ltd. Transfer printing. 4,292,103, Cl. 156-230.000.
Natarajan, Krishnaswamy: *See*—
Davis, John C. H.; and Natarajan, Krishnaswamy, 4,292,478, Cl. 179-170.0NC.
National Research Development Corporation: *See*—
Fray, Derek J.; and Thomas, Bernard K., 4,292,147, Cl. 204-118.000.
Hutchinson, Marcus H. R., 4,292,603, Cl. 331-94.50G.
National-Standard Company: *See*—
Johnson, Morris V., 4,291,445, Cl. 29-78.000.
Nawata, Takahiro: *See*—
Matsumoto, Takashi; and Nawata, Takahiro, 4,292,156, Cl. 204-192.0EC.
Nazzaro-Porro, Marcella. Process for treatment of hyperpigmentary dermatoses. 4,292,326, Cl. 424-317.000.
N'Debeka, Gilberte N.: *See*—
Boileau, Sylvie L.; Caubere, Paul J.; Raynal, Serge F.; Lecolier, Serge L.; and N'Debeka, Gilberte N., 4,292,421, Cl. 526-220.000.
Nedelec, Maurice; Presta, Claude; and Vitoux, Francois, to Saint Gobain Industries. Method and apparatus for shaping thermoplastic sheet material. 4,292,065, Cl. 65-104.000.
Nederlandse Centrale Organisatie voor Toegepastnatuurwetenschappelijk Onderzoek: *See*—
van Engelenburg, Bertus; and van Wijk, Hendrik F., 4,292,280, Cl. 423-24.000.
Neilson, John M. S.: *See*—
Assour, Jacques M.; Bates, Theresa I.; Bender, John R.; and Neilson, John M. S., 4,292,646, Cl. 357-38.000.
Nelson, Edward I., to Burroughs Corporation. Reconfigurable photoelectric keyboard having removable keys. 4,292,515, Cl. 250-229.000.
Nelson, Edward I., to Burroughs Corporation. Photo-optical keyboard having debris protection. 4,292,516, Cl. 250-229.000.
Nelson, Edward I., to Burroughs Corporation. Photo-optical keyboard providing tactile feel. 4,292,517, Cl. 250-229.000.

Nelson Industries, Inc.: *See*—
Stone, Walter H.; and Nostrand, William G., 4,292,179, Cl. 210-443.000.

Nelson, James F., to Quaker Oats Company, The. Apparatus for feeding fluidized bed incinerator, and method of autogenic operation of same. 4,291,635, Cl. 110-245.000.

Nelson, Melvin A.: *See*—
Davies, Terence J.; Franks, Larry A.; and Nelson, Melvin A., 4,292,537, Cl. 250-361.00R.

Nelson, Norman A., to Upjohn Company, The. Amide and sulfonamide derivatives of 2-decarboxy-2-aminomethyl-PG-type compounds. 4,292,445, Cl. 564-98.000.

Nelson, Stephen J., to Upjohn Company, The. N-[(Phosphinyl-)amino]thio- and N-[(phosphinothioyl)amino]thiomethylcarbamates. 4,292,256, Cl. 260-937.000.

Nepper, Robert F.; and Peterson, Dennis L., to Minnesota Mining and Manufacturing Company. Developer material level sensor. 4,292,530, Cl. 250-577.000.

Neracher, Arnold, to Battelle Memorial Institute. Pulsed gas laser emitting high-power beam of short wavelength. 4,292,600, Cl. 331-94.50G.

NeSmith, Kenneth L. Clip apparatus for concrete foundation forms. 4,291,858, Cl. 249-216.000.

Netherton, Lowell E.: *See*—
Patil, Arvind S.; and Netherton, Lowell E., 4,292,294, Cl. 423-594.000.

Newman, Ferris E., to Baxter Travenol Laboratories, Inc. Method for preshrinking semipermeable membranes. 4,291,470, Cl. 34-12.000.

Newsom, William D.; and Carnahan, James R., to K. R. Evans & Associates, a part interest. Apparatus for steam cleaning liners in oil well bores and the like. 4,291,433, Cl. 15-405.000.

Newton, William F.: *See*—
Mastroianni, Joseph E.; and Newton, William F., 4,292,098, Cl. 149-89.000.

Neye, Angelika: *See*—
Hechenberger, Dieter A.; and Neye, Angelika, 4,292,229, Cl. 260-30.60R.

Nezworski, James E., to Perlick Company, Inc., The. Keg tapping system unit and valve interlock. 4,291,821, Cl. 222-153.000.

NGK Spark Plug Co. Ltd.: *See*—
Nakahara, Kazumi, 4,291,626, Cl. 102-200.000.
Tanaka, Hiroshi; and Kato, Osamu, 4,292,049, Cl. 51-309.000.

Nichol, Thomas J.: *See*—
Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., 4,292,079, Cl. 75-232.000.

Nicolas, Alain: *See*—
Chataignon, Andre; Nicolas, Alain; and Poirier, Jean P., 4,292,479, Cl. 179-170.0NC.

Nielsen, Jan; and Panek, Karel J., to Byk-Mallinckrodt Cil B.V. Selenomethionine-^{75}Se-containing solution having a thiol as a stabilizer. 4,292,297, Cl. 424-1.000.

Nigro, Paul R., to Royal Continental Box Company. Combination collapsable self-erecting self-locking carton. 4,291,828, Cl. 229-41.00B.

Niguchi, Hirotoshi; and Ieki, Mitsuru, to Matsushita Electric Industrial Co., Ltd. Speaker diaphragm and method of preparation of the same. 4,291,781, Cl. 181-169.000.

Niimura, Tsutomu; Murakami, Kyoichi; and Yamakoshi, Akira, to Sony Corporation. Circuit for converting single-ended input signals to a pair of differential output signals. 4,292,597, Cl. 330-254.000.

Nimry, Baker N.: *See*—
Johnson, Donald A.; and Nimry, Baker N., 4,292,293, Cl. 423-571.000.

Ninomiya, Morimasa: *See*—
Ootsuka, Fumio; Ninomiya, Morimasa; Maehara, Norio; and Yoshimi, Akiro, 4,291,749, Cl. 165-27.000.

Nippon Denshoku Kogyo Co., Ltd.: *See*—
Tsujimura, Masatoshi, 4,291,985, Cl. 356-408.000.

Nippon Electric Co., Ltd.: *See*—
Tanaka, Kouichi, 4,292,552, Cl. 307-354.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,292,468, Cl. 179-1.00D.

Nippon Klingage Kabushiki Kaisha: *See*—
Hino, Mitsuaki, 4,292,582, Cl. 323-294.000.

Nippon Koshuha Steel Co., Ltd.: *See*—
Kawaguchi, Yosiyuki; Nishida, Takashi; Marukawa, Nobuaki; Tanaka, Tadakazu; and Kontani, Yoshinari, 4,291,600, Cl. 82-1.00C.

Nippon Paint Co., Ltd.: *See*—
Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, 4,292,096, Cl. 148-6.15Z.

Nippon Soda Company Limited: *See*—
Orii, Seiji; Sasagawa, Yukio; Ito, Akinori; Maruyama, Hiromi; and Sakai, Yoshiteru, 4,292,426, Cl. 536-95.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Yamamoto, Kazuyuki; and Ohkoshi, Seiei, 4,292,476, Cl. 179-99.00R.

Nippon Tungsten Co., Ltd.: *See*—
Honda, Sinya; Komura, Takeshi; Sugita, Naomi; and Okamoto, Tatuya, 4,292,078, Cl. 75-176.000.

Nippondenso Co., Ltd.: *See*—
Ootsuka, Fumio; Ninomiya, Morimasa; Maehara, Norio; and Yoshimi, Akiro, 4,291,749, Cl. 165-27.000.

Nishida, Takashi: *See*—
Kawaguchi, Yosiyuki; Nishida, Takashi; Marukawa, Nobuaki; Tanaka, Tadakazu; and Kontani, Yoshinari, 4,291,600, Cl. 82-1.00C.

Nishihara, Motohisa: *See*—
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nishihara, Motohisa; and Nagata, Takeo, 4,292,618, Cl. 338-5.000.

Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, to Teijin Limited. 25-Hydroxy-24-oxocholestane derivatives and preparation thereof. 4,292,249, Cl. 260-397.200.

Nishikuri, Masao; Takeshita, Akira; and Kenmochi, Hirohito, to Sumitomo Chemical Company, Limited. Process for producing anthraquinone intermediates. 4,292,247, Cl. 260-381.000.

Nishimura, Toshifumi: *See*—
Suzuki, Mikio; and Nishimura, Toshifumi, 4,291,659, Cl. 123-440.000.

Nishioka, Jim Z. Projectile shooting guide for bows. 4,291,664, Cl. 124-41.00A.

Nishizawa, Jun-ichi; and Kimura, Mitsuhiro, to Semiconductor Research Foundation. Sapphire single crystal substrate for semiconductor devices. 4,292,373, Cl. 428-446.000.

Nishizawa, Jun-ichi; and Kimura, Mitsuhiro, to Semiconductor Research Foundation. Sapphire single crystal substrate for semiconductor devices. 4,292,374, Cl. 428-446.000.

Nishizawa, Yoshihiko; Aketa, Yoshihiro; and Akao, Takeshi, to Kikkoman Shoyu Co., Ltd. Process for puffing feather or animal fur. 4,292,334, Cl. 426-447.000.

Nissan Motor Company, Limited: *See*—
Masaki, Kenji; and Nakamura, Koyo, 4,291,658, Cl. 123-440.000.
Suzuki, Mikio; and Nishimura, Toshifumi, 4,291,659, Cl. 123-440.000.

Nissha Printing Co., Ltd.: *See*—
Namura, Shigekazu; and Sumi, Takao, 4,292,103, Cl. 156-230.000.

Nisshin Kogyo Kabushiki Kaisha: *See*—
Mizusaki, Yoshinobu, 4,291,590, Cl. 74-551.800.

NL Industries, Inc.: *See*—
Robinson, Ralph L.; and Parrish, David D., 4,291,623, Cl. 102-310.000.

Noack, Rolf; and Gramelt, Stefan, to Deutsche Babcock Aktiengesellschaft. Apparatus for monitoring the temperature of adsorbers. 4,292,054, Cl. 55-181.000.

Nolen, Richard W.: *See*—
Probyn, Keith A.; Nolen, Richard W.; Erickson, Charles W.; Dawson, Gerald G.; Goldstein, Ralph; and Bender, Max, 4,292,034, Cl. 493-92.000.

Nomura, Hidetuka, to Sato, Hideji. Auxiliary cylinder for camera. 4,291,944, Cl. 350-257.000.

Nomura, Yasushi: *See*—
Morokawa, Shigeru; Sekiya, Fukuo; Hashimoto, Yukio; Nomura, Yasushi; and Koga, Keiichiro, 4,292,680, Cl. 368-187.000.

Nordica S.p.A.: *See*—
Sartor, Mariano, 4,291,473, Cl. 36-132.000.

Nordischer Maschinenbau Rud. Baader GmbH & Co. KG: *See*—
Hartmann, Franz, 4,291,435, Cl. 17-45.000.
Wulff, Hermann, 4,291,436, Cl. 17-59.000.

Norlin Industries, Inc.: *See*—
Scott, James L.; and Luce, David A., 4,291,604, Cl. 84-1.190.

Northern Petrochemical Co.: *See*—
Probyn, Keith A.; Nolen, Richard W.; Erickson, Charles W.; Dawson, Gerald G.; Goldstein, Ralph; and Bender, Max, 4,292,034, Cl. 493-92.000.

Northern Telecom, Inc.: *See*—
Adams, William J.; and Haskins, Steve W., 4,292,477, Cl. 179-100.00C.

Northern Telecom Limited: *See*—
Abe, Koichi, 4,292,063, Cl. 65-3.120.

Nostrand, William G.: *See*—
Stone, Walter H.; and Nostrand, William G., 4,292,179, Cl. 210-443.000.

Novak, Ronald W.; and Wolf, Leslie R., to Rohm and Haas Company. Addition polymer comprising air-curable alkyl diamide. 4,292,220, Cl. 260-23.0AR.

Novakovic, Boris Z.: *See*—
Eichenlaub, Rolf; and Novakovic, Boris Z., 4,291,667, Cl. 125-15.000.

Novametrix Medical Systems, Inc.: *See*—
Cabal, Luis A.; and Dali, Carmelo, 4,291,691, Cl. 128-204.180.

Novus Inc.: *See*—
Petersen, Paul S., 4,291,866, Cl. 269-1.000.

Nowak, Herman P., to Gillette Company, The. Liquid dispensing apparatus. 4,291,641, Cl. 118-408.000.

Nozawa, Takamitsu; and Tazaki, Takaharu, to Yoshino Kogyosho Co., Ltd. Lid structures. 4,291,818, Cl. 220-335.000.

Nugent, Richard M.: *See*—
Bosso, Joseph F.; Nugent, Richard M.; and Plasynski, Joseph E., 4,292,155, Cl. 204-181.00C.

Obermayer, Alfred, to Bombardier-Rotax Gesellschaft m.b.H. Pullback starter for internal combustion engines. 4,291,654, Cl. 123-185.0BA.

O'Boyle, Matthew; and Magladry, Ross E., to Catalyst Research Corporation. Two-cell battery structure. 4,292,380, Cl. 429-101.000.

Odendahl, Manfred H. A.: *See*—
Wolfsgruber, Friedrich; Kasel, Hans W.; Odendahl, Manfred H. A.; and Morsdorf, Wolfram W., 4,292,075, Cl. 75-130.00R.

Odlen, Lars; and Hansson, Anders, to Transcale A.B. Control for audio receiver. 4,292,467, Cl. 179-1.00D.

Office National d'Etudes et de Recherches Aerospatiales: *See*—
Lepetit, Pierre J.; and Genieys, Emile J., 4,292,144, Cl. 204-23.000.
Officine Meccaniche Pavesi & C. S.p.A.: *See*—
Barrera, Giorgio, 4,291,459, Cl. 29-734.000.
Ogasawara, Makoto: *See*—
Inata, Hiroo; Ogasawara, Makoto; Morinaga, Tsuto; and Horike, Akihiro, 4,292,151, Cl. 204-159.150.
Ogawa, Koichi; Tezuka, Shichigoro; Terasawa, Masatoshi; and Iwata, Shizuo, to Lotte Co., Ltd. Center-filled chewing gum. 4,292,329, Cl. 426-5.000.
Ogawa, Masahiro: *See*—
Fujimura, Kensuke; Yamamoto, Naomichi; Ogawa, Masahiro; and Tanigawa, Nobuyoshi, 4,291,549, Cl. 62-534.000.
Ogawa, Yoshifusa: *See*—
Fujii, Masao; Ogawa, Yoshifusa; and Morihiro, Yoshiyuki, 4,291,758, Cl. 165-133.000.
Ogawa, Yoshio: *See*—
Kato, Heizaburo; and Ogawa, Yoshio, 4,291,553, Cl. 64-29.000.
Ohashi, Hiroshi: *See*—
Kondo, Mikio; Inoue, Hiromitsu; and Ohashi, Hiroshi, 4,292,679, Cl. 367-188.000.
Ohashi, Shigeo. Switching element. 4,292,615, Cl. 335-205.000.
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, to Bridgestone Tire Co., Ltd. Urethane modified polyisocyanurate foam surfaced with aluminum foil or sheet. 4,292,353, Cl. 428-211.000.
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; and Arai, Katsuhiko, to Bridgestone Tire Co., Ltd. Asbestos-metal surfaced urethane modified polyisocyanurate foam. 4,292,361, Cl. 428-215.000.
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; and Kaneda, Hiroshi, to Bridgestone Tire Company Limited. Fireproof laminates. 4,292,369, Cl. 428-313.000.
Ohgushi, Masuhito: *See*—
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; Kitahara, Tohru; and Watanabe, Kenichi, 4,292,433, Cl. 556-479.000.
Ohkawa, Tihiro, to United States of America, Energy. Tokamak with liquid metal for inducing toroidal electrical field. 4,292,126, Cl. 176-3.000.
Ohkoshi, Seiei: *See*—
Yamamoto, Kazuyuki; and Ohkoshi, Seiei, 4,292,476, Cl. 179-99.00R.
Ohkuma Seisakusho Co., Ltd.: *See*—
Nagato, Nobuo, 4,291,879, Cl. 273-119.00R.
Ohnishi, Masaaki; and Saito, Akio, to Kabushiki Kaisha Kyoto Daiichi Kagaku. Reference scatter for use in the correction of scattering photometers. 4,291,981, Cl. 356-244.000.
Ohno, Osamu: *See*—
Satou, Takehide; Yoshida, Kasumi; Sagusa, Hisayuki; Ohno, Osamu; and Abe, Tetuaki, 4,291,986, Cl. 356-410.000.
Ohta, Hiroki: *See*—
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,292,070, Cl. 71-96.000.
Ohtomo, Fumio, to Tokyo Kogaku Kikai Kabushiki Kaisha. Apparatus for, and method for, achieving a temperature compensation of an avalanche photodiode. 4,292,514, Cl. 250-214.00C.
Ohwada, Hirobumi: *See*—
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.
Ojima, Kenji: *See*—
Goto, Hiromi; and Ojima, Kenji, 4,291,791, Cl. 192-67.00R.
Okada, Kazuya: *See*—
Kamada, Kazumasa; and Okada, Kazuya, 4,292,419, Cl. 526-192.000.
Okamoto, Tatuya: *See*—
Honda, Sinya; Komura, Takeshi; Sugita, Naomi; and Okamoto, Tatuya, 4,292,078, Cl. 75-176.000.
Okamura, Masatoshi; and Shiba, Haruo, to TDK Electronics. Tape cassette. 4,291,800, Cl. 206-387.000.
Okano, Kinpei: *See*—
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; and Furukawa, Yosio, 4,291,926, Cl. 308-73.000.
OKI Electronics of America, Inc.: *See*—
Morrell, Wilfred L.; and Levine, William M., 4,292,474, Cl. 179-99.00M.
Okuda, Shigeru: *See*—
Danjyo, Hiroyuki; Okuda, Shigeru; and Yorita, Eiichi, 4,292,082, Cl. 501-100.000.
Okumoto, Yutaka, to Japan Tobacco & Salt Public Corporation, The. Material density radiological measurement system with substantially linear output. 4,292,522, Cl. 250-358.00R.
Okuyama, Takeshi: *See*—
Yokoyama, Toshiaki; Hara, Akira; and Okuyama, Takeshi, 4,292,533, Cl. 290-40.00B.
Okuyama, Toru: *See*—
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; and Arai, Katsuhiko, 4,292,361, Cl. 428-215.000.
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; and Kaneda, Hiroshi, 4,292,369, Cl. 428-313.000.
Oldfield, William W.; and Bier, Larry J., to Wiltron Company. Coaxial connector with improved female conductor structure. 4,291,936, Cl. 339-177.00R.
Olin Corporation: *See*—
Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,292,159, Cl. 204-237.000.
Olson, Gerald: *See*—
Robertson, Alan D.; Robertson, Blythe J.; and Olson, Gerald, 4,291,736, Cl. 145-30.00A.
Olympus Optical Co., Ltd.: *See*—
Hayamizu, Yoshisada, 4,291,945, Cl. 350-286.000.
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,292,509, Cl. 235-92.0MP.
Takase, Hiroshi; and Fujii, Toru, 4,291,952, Cl. 350-471.000.
Takayama, Syuichi, 4,291,961, Cl. 354-62.000.
Omnipure, Inc.: *See*—
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Orain, Michel A., to Glaenzer Spicer. Axial retaining device in particular for a homokinetic tripod joint. 4,291,552, Cl. 64-21.000.
Orcutt, John W., to Texas Instruments Incorporated. Proportional stroke automatic temperature control system. 4,291,717, Cl. 137-86.000.
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Petitpierre, Jean C., to Ciba-Geigy Corporation. Pressure-sensitive or heat-sensitive recording material. 4,291,901, Cl. 282-27.500.

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Raccah, Paul M., to Scientific Gem Identification, Inc. Apparatus for determining the color characteristics of a gem. 4,291,975, Cl. 356-30.000.
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Johnson, Henry C., 4,292,637, Cl. 343-6.5SS.
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Reckin, George M.; Lofy, Richard A.; and Dean, Robert S., to Lakeside Bridge & Steel Co. Apparatus for opening and closing air lock doors. 4,291,500, Cl. 49-68.000.
Redden, George H., to Westinghouse Electric Corp. Multiple heat pump and heat balancing system for multi-stage material processing. 4,291,757, Cl. 165-104.310.
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Reichert, James B. Method of fabricating composite members. 4,292,101, Cl. 156-156.000.
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Renwick, Peter J., to Craven Tasker (Andover) Limited. Agricultural implements. 4,291,638, Cl. 111-61.000.
Repa, Otto, to Mauser-Werke Oberndorf GmbH. Sight rail for shoulder firearms. 4,291,476, Cl. 42-1.0ST.
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Reul, Helmut, to Medac Gesellschaft fur Klinische Spezialpraparate mbH. Artificial heart valve. 4,291,420, Cl. 3-1.500.
Reusser, Robert E., to Phillips Petroleum Co. Production of high purity uranium compounds from crude yellow cake. 4,292,279, Cl. 423-15.000.
Rey-Coquais, Bruno, to Rhone-Poulenc Industries. Liquid dielectric compositions comprising bromochlorobenzene/polychlorobenzene admixtures. 4,292,462, Cl. 174-17.0LF.
Reynolds, Darcie F. Drum winches. 4,291,864, Cl. 254-375.000.
Reynolds, Ellis W.; and Joyce, Edward R., to SCM Corporation. Tree slashing apparatus. 4,291,492, Cl. 47-12.000.
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Richter, Simon J.; and Sanscharowskiy, Michael, to Coca-Cola Company, The. Reject system for in-line pressure testing systems. 4,291,573, Cl. 73-37.000.
Ricks, Jay W. Floatable solar heat modules. 4,291,672, Cl. 126-415.000.
Ricoh Co., Ltd.: *See—*
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Rifkin, Ellis B., to Ethyl Corporation. Method for inhibiting deposit formation in distillation units associated with separation and purification of alkyl phosphorochloridothioates. 4,292,139, Cl. 203-6.000.
Riley, Norman, to Imperial Chemical Industries Limited. Aniline derivatives. 4,292,446, Cl. 564-221.000.
Ring, David F., to Johnson & Johnson Products, Inc. Compact tampon-applicator assembly with ribbed inner tube. 4,291,696, Cl. 128-263.000.
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Riti, Alfred A. Knot securing device. 4,291,439, Cl. 24-119.000.
Rittenbach, Otto E., to United States of America, Army. Signal processing system. 4,292,635, Cl. 343-5.0NQ.
Rivier, Jean E. F.: *See—*
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Robert Bosch GmbH: *See—*
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Robertson, Alan D.; Robertson, Blythe J.; and Olson, Gerald, to Robertson, Alan D.; and Robertson, Blythe J. Magnetic hammer. 4,291,736, Cl. 145-30.00A.
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Robinson, Keith, to Dowty Fuel Systems Limited. Fuel supply system. 4,291,532, Cl. 60-223.000.
Robinson, Ralph L.; and Parrish, David D., to NL Industries, Inc. Binary electroexplosive device and method of assembly thereof. 4,291,623, Cl. 102-310.000.
Rockwell International Corporation: *See*—
Glass, Howard L., 4,292,119, Cl. 156-624.000.
Williams, Ernest E.; and Brennan, William M., 4,291,867, Cl. 269-43.000.
Rodgers, Aubrey; and Bailey, Escar L., to United States of America, Army. Reaction-jet torquer. 4,291,849, Cl. 244-3.220.
Rodgers, Robert L., III, to RCA Corporation. Relaxation oscillators with electrical control of periodicities of oscillation. 4,292,605, Cl. 331-111.000.
Rodth, Joseph J., to Alco Foodservice Equipment Company. Cold plate heat exchanger. 4,291,546, Cl. 62-398.000.
Roeder, Robert S.: *See*—
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Rohm and Haas Company: *See*—
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Rohrbach, Ronald P.; and Maliarik, Mary J., to UOP Inc. Method of preparing a support matrix. 4,292,199, Cl. 252-430.000.
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. 2,3-Substituted-1,2-isothiazolium salt antimicrobials. 4,292,430, Cl. 548-206.000.
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Dinsdale, Raymond, 4,291,566, Cl. 72-342.000.
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Meetham, Geoffrey W.; and Marjoram, John R., 4,292,010, Cl. 416-241.00R.
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Roloff, Carl A., to Allis-Chalmers Corporation. Roller conveyor-classifier. 4,291,808, Cl. 209-668.000.
Roman, Steven A.; and Soloway, Samuel B., to Shell Oil Company. Oxyimino-substituted (1R,cis)cyclopropanecarboxylate pesticides. 4,292,325, Cl. 424-304.000.
Ron, Moshe; Gruen, Dieter M.; Mendelsohn, Marshall H.; and Sheft, Irving, to United States of America, Energy. Method for preparing porous metal hydride compacts. 4,292,265, Cl. 264-82.000.
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Hartley, Kenneth; Moulding, Trevor L. J.; and Rostron, Norman, 4,292,127, Cl. 176-17.000.
Roth, Zdenek; and Altmann, Josef, to SKODA, oborovy podnik. Arrangement for sucking-off gases. 4,292,259, Cl. 261-123.000.
Rothbuhr, Lothar; and Witte, Josef, to Deutsche Gold- Und Silber-Scheideanstalt Vormals Roessler. Process for the production of furnace black. 4,292,291, Cl. 423-450.000.
Rouf, Mohammad A., to Kewanee Boiler Corporation. High voltage electrode steam boiler and electrode assembly therefor. 4,292,498, Cl. 219-288.000.
Rowden, George A.: *See*—
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Rowland-Hill, E. W.: *See*—
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Saito, Akira; Yamori, Akio; and Ibaragi, Toshio, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of modified block copolymers. 4,292,414, Cl. 525-255.000.
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Sakurai, Shoichiro; and Otani, Tadahiko, to Hitachi, Ltd. Altitude compensating device for carburetors. 4,292,258, Cl. 261-39.00A.
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Samijn, Rafael P.: *See—*
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Sanders, Murray J.; and Vick, James A., to Biotherapeutics, Inc. Treatment of animals exposed to or subject to exposure to organophosphate animal poisonous nerve agents. 4,292,308, Cl. 424-98.000.

Sanders, Nicholas A.: *See—*
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Sanin, Sergei A.; Ponomarenko, Jury F.; Firstov, Vladislav D.; Khorin, Vladimir N.; Ragutsky, Arnold M.; Kostjunin, Boris N.; and Bronfen, Petr M. Pressure valve. 4,291,718, Cl. 137-87.000.

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Santambrogio, Vincenzo, to IMBAC S.p.A. Torque reduction unit having small bevel gears, particularly for the operation of rolling shutters. 4,291,593, Cl. 74-799.000.

Santoli, Pat A.; and Baybrook, Howard E., to Allegheny Ludlum Steel Corporation. Process of rolling iron-silicon strip material. 4,291,558, Cl. 72-38.000.

Santos, Gerard R., to Budd Company, The. Replacement handle for a tool. 4,291,998, Cl. 403-263.000.

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Sarnoff, Stanley J. Cyanide antidote. 4,292,311, Cl. 424-162.000.

Sartor, Mariano, to Nordica S.p.A. Ski boot device for facilitating walking. 4,291,473, Cl. 36-132.000.

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Jueneman, Robert R., 4,292,683, Cl. 370-104.000.

Sato, Hideji: *See—*
Nomura, Hidetuka, 4,291,944, Cl. 350-257.000.

Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, to Olympus Optical Co., Ltd. Indicator for tape running direction and tape remnant amount. 4,292,509, Cl. 235-92.0MP.

Satoh, Ken: *See—*
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Satou, Takehide; Yoshida, Kasumi; Sagusa, Hisayuki; Ohno, Osamu; and Abe, Tetuaki, to Hitachi, Ltd. Optical rate assay apparatus. 4,291,986, Cl. 356-410.000.

Sauer, Hans: *See—*
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Ono, Kenji; Matsushita, Hidetoshi; and Shibata, Minoru, 4,292,614, Cl. 335-202.000.

Saunders, Albert A., to ASA Enterprises, Inc. Wire drawing device. 4,291,565, Cl. 72-290.000.

Sawaryn, John, to United States of America, Navy. Rubber boot expander. 4,291,454, Cl. 29-426.600.

Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., to Exxon Research & Engineering Co. Process for selective removal of cyclic urea from hindered amine gas treating solution. 4,292,286, Cl. 423-223.000.

Schaaf, Thomas K.: *See—*
Eggler, James F.; and Schaaf, Thomas K., 4,292,444, Cl. 564-97.000.

Schaefer, Edward J., to Franklin Electric Co., Inc. Start winding cut-out circuit for an electric motor. 4,292,555, Cl. 310-68.00R.

Schaffner, Carl P.: *See—*
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Schaper, Lambert: *See—*
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Scharf, Hans-Dieter; and Frauenrath, Herbert, to Bayer Aktiengesellschaft. Preparation of tetrahydrofuran-3-aldehydes. 4,292,246, Cl. 260-347.400.

Schaumann, Wolfgang: *See—*
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Scheel, Randall: *See—*
Fisher, Richard L.; Wright, David J.; and Scheel, Randall, 4,291,753, Cl. 165-94.000.

Scheidegger, Hans: *See—*
Galafassi, Pierre; Adam, Jean-Marie; Loew, Peter; and Scheidegger, Hans, 4,292,037, Cl. 8-554.000.

Scheiderer, Willard R., to Grede Foundries, Inc. Foundry mold jacket. 4,291,745, Cl. 164-394.000.

Schekin, Vadim M.: *See—*
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A., 4,292,494, Cl. 219-76.130.

Schellenberg, Hans; Schenkel, Eduard; Schwander, Andreas; and Thalmann, Dieter, to Rieter Machine Works, Ltd. False twist machine. 4,291,529, Cl. 57-291.000.

Schelleng, Robert D.: *See—*
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Schellmann, Erhard: *See—*
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Schenkel, Willi; and Seger, Hans, to Egli, Fischer & Co. AG. Pipe clamp. 4,291,855, Cl. 248-74.00A.

Scherbatenko, Boris G.: *See—*
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Schering Corp.: *See—*
Kistler, Frederic E., 4,291,688, Cl. 128-200.230.
Tahbaz, Pirouz, 4,292,323, Cl. 424-274.000.

Scheuffgen, Ingeborg; and Ploog, Uwe, to Henkel Kommanditgesellschaft auf Aktien. Beeswax substitute. 4,292,088, Cl. 106-268.000.

Scheuneman, James H., to Sperry Corporation. One word buffer memory system. 4,292,674, Cl. 364-900.000.

Schlinsog, Hans-Juergen, to Continental Group, Inc., The. Process for hydrophilization of metal surfaces and/or metal oxide surfaces. 4,292,095, Cl. 148-6.14R.

Schloemann-Siemag Aktiengesellschaft: *See—*
Claussen, Paul O., 4,291,571, Cl. 72-453.180.
Muckli, Heinz, 4,291,564, Cl. 72-234.000.

Schlosser, Philip A.; and Miller, Don W., to Picker Corporation. Charge splitting resistive layer for a semiconductor gamma camera. 4,292,645, Cl. 357-29.000.

Schlumberger Technology Corporation: *See—*
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Johnstone, Charles W., 4,292,518, Cl. 250-262.000.
Smith, Glenn S., 4,292,588, Cl. 324-221.000.

Schmid, Walter; Breitschwerdt, Werner; and Huber, Guntram, to Daimler-Benz Aktiengesellschaft. Deflection fitting for safety belts for vehicles. 4,291,919, Cl. 297-483.000.

Schmidt, Ernst M.: *See—*
Bekkering, Hendrik M.; and Schmidt, Ernst M., 4,291,695, Cl. 128-218.0NV.

Schmidt, Frederick J. Dredge swell compensator apparatus. 4,291,474, Cl. 37-67.000.

Schmidt, Gunther: *See—*
Tauber, Oswald; Engelhardt, Gunther; Leitold, Matyas; and Schmidt, Gunther, 4,292,319, Cl. 424-250.000.

Schmitt, Frederick L.: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,292,447, Cl. 568-378.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,292,193, Cl. 252-174.110.

Schneider, Klaus-Juergen: *See—*
Lindner, Alfred; Volkamer, Klaus; Wagner, Ulrich; Pommer, Dieter; Schneider, Klaus-Juergen; and Schwentker, Harald, 4,292,141, Cl. 203-49.000.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; and LeVan, Leon W., 4,292,250, Cl. 260-397.200.

Schnyder, William J., to Emerson Electric Co. Method of making an extended life, moisture resistant electric motor and method of making same. 4,291,455, Cl. 29-596.000.

Schoeff, John A., to Advanced Micro Devices, Inc. Monolithic digital-to-analog converter. 4,292,625, Cl. 340-347.0DA.

Schoemer, Hans L., to Motorola, Inc. Labelling device. 4,291,475, Cl. 40-338.000.

Scholten, Joseph J. F.: *See—*
Gerritsen, Leendert A.; and Scholten, Joseph J. F., 4,292,198, Cl. 252-428.000.

Schrock, Jesse C. E., to Boeing Company, The. Duct seal. 4,291,905, Cl. 285-192.000.

Schroder, Rolf; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Novel α-isocyanocarboxylic acid compounds and plant growth regulant compositions. 4,292,072, Cl. 71-105.000.

Schukei, Glen E.; Horlacher, Walter R., III; and Sampson, William T., to Combustion Engineering, Inc. Hydraulically centered control rod. 4,292,132, Cl. 176-36.00S.

Schule, Wolfgang: *See—*
Hentschel, Karl-Heinz; Dhein, Rolf; and Schule, Wolfgang, 4,292,187, Cl. 252-49.500.

Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., to Wheelabrator-Frye Inc. Guard housing and liner for bladed centrifugal blasting wheels. 4,291,509, Cl. 51-432.000.

Schulte, Klaus; and Ersfeld, Heinrich, to Bayer Aktiengesellschaft. Apparatus for the preparation of a reaction mixture from fluid components. 4,291,991, Cl. 366-159.000.
Schundehutte, Karl H.: *See*—
Kruckenberg, Winfried; and Schundehutte, Karl H., 4,292,239, Cl. 260-158.000.
Schuster, Hans: *See*—
Stahl, Werner; Breuer, Uwe; Richter, Bernhard; Alstetter, Franz; Krappmann, Franz; and Schuster, Hans, 4,292,177, Cl. 210-325.000.
Schwander, Andreas: *See*—
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Schyns, Pierre D.: *See*—
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Scientific Gem Identification, Inc.: *See*—
Raccah, Paul M., 4,291,975, Cl. 356-30.000.
Scintrex Limited: *See*—
Seigel, Harold O., 4,291,978, Cl. 356-152.000.
SCM Corporation: *See*—
Cardenas, Carlos G.; and Ud Din, Zia, 4,292,454, Cl. 585-16.000.
Cardenas, Carlos G.; and Ud Din, Zia, 4,292,459, Cl. 585-641.000.
Reynolds, Ellis W.; and Joyce, Edward R., 4,291,492, Cl. 47-12.000.
Scoggins, Lacey E.: *See*—
Shue, Robert S.; and Scoggins, Lacey E., 4,292,416, Cl. 525-420.000.
Scondo, Christian: *See*—
Kunst, Helmut; and Scondo, Christian, 4,292,094, Cl. 148-6.110.
Scott, Allan W.: *See*—
Fritchle, Cliff D.; Hobrecht, Charles E.; and Scott, Allan W., 4,292,567, Cl. 315-3.500.
Scott, Brian L.; and Hardesty, Lee H., to Scott Instruments Company. Voice pitch detector and display. 4,292,469, Cl. 179-1.0SC.
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Scott, Brian L.; and Hardesty, Lee H., 4,292,469, Cl. 179-1.0SC.
Scott, James L.; and Luce, David A., to Norlin Industries, Inc. Memory override system for programmed electronic synthesizer. 4,291,604, Cl. 84-1.190.
Seeley, Leonard, to Plastofilm Industries, Inc. Ice cream cone tray. 4,291,805, Cl. 206-563.000.
Seger, Hans: *See*—
Schenkel, Willi; and Seger, Hans, 4,291,855, Cl. 248-74.00A.
Seghezzi, Hans-Dieter: *See*—
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Seigel, Harold O., to Scintrex Limited. Apparatus for automatically determining the position at which a beam of light impinges on a target. 4,291,978, Cl. 356-152.000.
Seiger, Harvey N.; and Puglisi, Vincent J., to Yardney Electric Corporation. Method of making sintered plaque nickel electrodes. 4,292,143, Cl. 204-2.100.
Seigneurin, Laurent: *See*—
Pajot, Michel; and Seigneurin, Laurent, 4,292,295, Cl. 423-625.000.
Seiki, Kazuo; and Miyamoto, Noriaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Fiber feeding roller of open-end spinning apparatus. 4,291,438, Cl. 19-112.000.
Sekiya, Fukuo: *See*—
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Selander, Lennart; Fahlen, Lars; and Sipek, Ladislav, to AGA Aktiebolag. Method for decomposing ozone. 4,292,493, Cl. 219-74.000.
Sels, Francis J.: *See*—
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Pollet, Robert J.; Kokelenberg, Hendrik E.; Samijn, Rafael P.; Sels, Francis J.; Ville, Frans J.; and de Jaeger, Nikolaas C., 4,292,402, Cl. 430-631.000.
Semanaz, Daniel; and Cassat, Robert, to Rhone-Poulenc Industries. Modular, constructional heating unit. 4,292,500, Cl. 219-345.000.
Semiconductor Research Foundation: *See*—
Nishizawa, Jun-ichi; and Kimura, Mitsuhiro, 4,292,373, Cl. 428-446.000.
Nishizawa, Jun-ichi; and Kimura, Mitsuhiro, 4,292,374, Cl. 428-446.000.
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Senneke, Darrell M.: *See*—
Lee, Richard J.; Meyer, Delbert H.; and Senneke, Darrell M., 4,292,452, Cl. 568-881.000.
Senor, Charles: *See*—
Giordano, Vincent; and Senor, Charles, 4,291,807, Cl. 206-626.000.
Serp, William K. International Morse Code number generator. 4,292,624, Cl. 340-347.0DD.
Servadio, Robert. Drill attachment. 4,291,429, Cl. 15-104.3SN.
Service (Engineers) Limited: *See*—
Davies, Graham, 4,292,006, Cl. 409-131.000.
Servo Corporation of America: *See*—
Bambara, Joseph E., 4,292,639, Cl. 343-113.0DE.
Sevastakis, Gus. Cooler for twin strand continuous casting. 4,291,747, Cl. 164-420.000.
Severinghaus, Edwin M.: *See*—
Severinghaus, John W.; and Severinghaus, Edwin M., 4,291,705, Cl. 128-733.000.
Severinghaus, John W.; and Severinghaus, Edwin M., to University of California, The Regents of the. Neuromuscular block monitor. 4,291,705, Cl. 128-733.000.
Seymour, Theodore J.: *See*—
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Shaffer, Peter T. B.; and Gaffney, Michael F., to Carborundum Company, The. Cask for radioactive material and method for preventing release of neutrons from radioactive material. 4,292,528, Cl. 250-506.000.
Sharp Kabushiki Kaisha: *See*—
Yamasaki, Hitoshi; and Iwawaki, Yasutaka, 4,291,620, Cl. 101-99.000.
Sharples, Wilbert, to Lockheed Corporation. Contractable shock absorber strut. 4,291,850, Cl. 244-102.0SS.
Shaver, William A. Display stand. 4,291,811, Cl. 211-205.000.
Shaw Mudge & Company: *See*—
Herman, Justin, 4,292,211, Cl. 252-529.000.
Shawcross, Alfred L.: *See*—
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Shedler, Gerald St.: *See*—
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Sheft, Irving: *See*—
Ron, Moshe; Gruen, Dieter M.; Mendelsohn, Marshall H.; and Sheft, Irving, 4,292,265, Cl. 264-82.000.
Sheiko, Pavel P.: *See*—
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Shell Oil Company: *See*—
Davies, David R.; Zuiderwijk, Jacobus J. M.; and Hagelaars, Adrianus M. P. M., 4,291,766, Cl. 166-276.000.
Post, Martin F. M.; and Schaper, Lambert, 4,292,410, Cl. 518-714.000.
Roman, Steven A.; and Soloway, Samuel B., 4,292,325, Cl. 424-304.000.
Shen, Jian-Kuo: *See*—
Miller, Robert C.; Bradley, John J.; King, Richard L.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,292,668, Cl. 364-200.000.
Shiba, Haruo: *See*—
Okamura, Masatoshi; and Shiba, Haruo, 4,291,800, Cl. 206-387.000.
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, to Kyoshin Co., Ltd. Solid fuel. 4,292,044, Cl. 44-1.00R.
Shibata, Minoru: *See*—
Ono, Kenji; Matsushita, Hidetoshi; and Shibata, Minoru, 4,292,614, Cl. 335-202.000.
Shibata, Yuji: *See*—
Fujita, Kenji; Shibata, Yuji; Mikuni, Hisao; and Shibuya, Tsuneo, 4,292,137, Cl. 202-248.000.
Shibuya, Tsuneo: *See*—
Fujita, Kenji; Shibata, Yuji; Mikuni, Hisao; and Shibuya, Tsuneo, 4,292,137, Cl. 202-248.000.
Shields, J. Rodger, to Carrier Corporation. Power generation unit. 4,291,540, Cl. 60-694.000.
Shiiki, Zenya: *See*—
Nakao, Masaaki; and Shiiki, Zenya, 4,292,285, Cl. 423-210.000.
Shimada, Satoshi: *See*—
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nishihara, Motohisa; and Nagata, Takeo, 4,292,618, Cl. 338-5.000.
Shimiya, Keiji: *See*—
Tanaka, Michio; Miura, Norio; and Shimiya, Keiji, 4,292,107, Cl. 156-249.000.
Shimizu, Hideo: *See*—
Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, 4,292,096, Cl. 148-6.15Z.
Shin-Etsu Chemical Co., Ltd.: *See*—
Takeuchi, Satoshi; Akada, Masanori; Fujii, Hitoshi; Toida, Takashi; Takamizawa, Minoru; and Inoue, Yoshio, 4,292,397, Cl. 430-303.000.
Shinagawa Refractories Co. Ltd.: *See*—
Danjyo, Hiroyuki; Okuda, Shigeru; and Yorita, Eiichi, 4,292,082, Cl. 501-100.000.
Shinkai, Ichiro: *See*—
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Shinoda, Nobuhiko: *See*—
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Shinozaki, Fumiaki: *See*—
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Wada, Minoru; Shinozaki, Fumiaki; Takahashi, Yohnosuke; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,292,393, Cl. 430-275.000.
Wada, Minoru; Shinozaki, Fumiaki; Takahashi, Yohnosuke; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,292,395, Cl. 430-299.000.

Shionogi & Co., Ltd.: *See—*
Tanaka, Kentaro; Shoji, Jun'ichi; Kawamura, Yoshimi; Hattori, Teruo; Kondo, Eiji; Matsumoto, Kouichi; Yoshida, Tadashi; and Tsuji, Naoki, 4,292,241, Cl. 260-245.20T.

Shiotani, Akinori: *See—*
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Shiraki, Masao: *See—*
Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,291,528, Cl. 57-58.950.

Shkatov, Alexandr S.: *See—*
Korytov, Vladimir A.; Maljushevsky, Pavel P.; Guly, Grigory A.; Shkatov, Alexandr S.; Sladkoshteev, Vladimir T.; Patanin, Ruslan V.; Dorokhov, Vasily I.; Klemeshov, Georgy A.; and Arkulis, Grigory E., 4,291,742, Cl. 164-501.000.

Shoemaker, John J.; and Stark, Kenneth R. Hydraulic toilet seat. 4,291,422, Cl. 4-251.000.

Shoji, Jun'ichi: *See—*
Tanaka, Kentaro; Shoji, Jun'ichi; Kawamura, Yoshimi; Hattori, Teruo; Kondo, Eiji; Matsumoto, Kouichi; Yoshida, Tadashi; and Tsuji, Naoki, 4,292,241, Cl. 260-245.20T.

Shrier, Adam L.: *See—*
Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., 4,292,181, Cl. 210-638.000.

Shue, Robert S.; and Scoggins, Lacey E., to Phillips Petroleum Co. Polymer blends. 4,292,416, Cl. 525-420.000.

Shultz, William L., Jr. Guide rule for automobile moulding or the like. 4,291,467, Cl. 33-177.000.

Sick, Erwin; and Mankel, Siegfried, to Erwin Sick GmbH, Optik-Elektronik. Hole seeking apparatus. 4,291,987, Cl. 356-431.000.

Sid Richardson Carbon & Gasoline Company: *See—*
Pobst, David F., 4,292,024, Cl. 432-13.000.

Siemens Aktiengesellschaft: *See—*
Auinger, Herbert; Bradler, Peter; Weppler, Rudolf; and Stepina, Jaroslav, 4,292,559, Cl. 310-206.000.
Cirkler, Werner; and Krueger, Hans, 4,291,947, Cl. 350-336.000.
Ebert, Hermann; Gruntleitner, Johann; and Kuhnlein, Hans, 4,292,573, Cl. 318-138.000.
Eckel, Giselher, 4,292,466, Cl. 178-3.000.
Egger, Walter; Edinger, Egon; and Pedall, Friedrich, 4,292,636, Cl. 343-6.5SS.
Feuerbaum, Hans P., 4,292,519, Cl. 250-310.000.
Hetz, Walter; and Derndinger, Walter, 4,291,578, Cl. 73-633.000.
Heynisch, Hinrich; Huebner, Erwin; and Barth, Heinz, 4,292,566, Cl. 315-3.500.
Kellner, Walter; Kniepkamp, Hermann; and Ristow, Dietrich, 4,292,643, Cl. 357-15.000.
Kleinschmidt, Peter; Meixner, Hans; and Magori, Valentin, 4,292,499, Cl. 219-308.000.
Kolmann, Ewald, 4,292,551, Cl. 307-311.000.
Kuhnlein, Hans; Gruntleitner, Hans; and Ebert, Hermann, 4,292,575, Cl. 318-254.000.
Martin, Erwin, 4,292,561, Cl. 310-322.000.
Ott, Gunther; and Kaufhold, Wolfgang, 4,292,580, Cl. 323-212.000.
Plaettner, Rolf; Kruehler, Wolfgang; and Grabmaier, Josef, 4,292,343, Cl. 427-39.000.
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, 4,292,398, Cl. 430-306.000.
Trimmel, Herwig, 4,292,606, Cl. 332-7.510.
Tschunt, Edgar, 4,292,525, Cl. 250-445.00T.
Vogt, Herbert; Wassill, Lothar; and Wengler, Christian, 4,292,464, Cl. 174-152.0GM.
Vorndran, Albin, 4,292,560, Cl. 310-242.000.

Sigalla, Armand, to Boeing Company. Airplane all-moving airfoil with moment reducing apex. 4,291,853, Cl. 244-87.000.

Sigarettenfabriek Ed. Laurens B.V.: *See—*
Koster, Hendrikus J.; Bik, Johannes T. J.; Clardey, Johannes G.; and Smorenberg, Dirk, 4,291,712, Cl. 131-339.000.

Sigman, Earl H., to AMCA International Corporation. Apparatus for stripping ingots from molds. 4,291,746, Cl. 164-407.000.

Signetics Corporation: *See—*
Hoeft, Werner H., 4,292,583, Cl. 323-316.000.

Sigyoo, Masamiti: *See—*
Ikeda, Tomoaki; Sigyoo, Masamiti; Ikeda, Sadaharu; Yoshida, Satoshi; and Tomotsu, Takeshi, 4,292,388, Cl. 430-162.000.

Sih, John C., to Upjohn Company, The. 13,14-Didehydro-9-deoxy-9-methylene-19-oxo-PGF_2 compounds. 4,292,438, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. 13,14-Dihydro-inter-oxa-11-deoxy-11-hydroxymethyl-9-deoxy-9-methylene-19-oxo-PGF_1 compounds. 4,292,439, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. 13,14-Didehydro-9-deoxy-9-methylene-19-oxo-PGF_1 compounds. 4,292,440, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-11-hydroxymethyl-9-deoxy-9-methylene-19-oxo-PGF_2 compounds. 4,292,441, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-19-oxo-PGF_2 compounds. 4,292,442, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-11-hydroxymethyl-19-oxo-PGE_2 compounds. 4,292,443, Cl. 562-503.000.

Silken, Howard. Router guide. 4,291,735, Cl. 144-136.00C.

Silverberg, Morton, to Xerox Corporation. Dual mode document belt system. 4,291,974, Cl. 355-76.000.

Simmons, Gerald C., to Boeing Company, The. Parachute release for cargo aircraft. 4,291,852, Cl. 244-147.000.

Simmons, Richard R.; and Thompson, Harvey A., to Chubb Fire Security Limited. Heat detector circuit. 4,292,513, Cl. 250-205.000.

Simon, Jacques: *See—*
Henry, Raymond; and Simon, Jacques, 4,291,942, Cl. 350-96.200.

Simonds, Lawrence. Guitar strap. 4,291,822, Cl. 224-257.000.

Simone, Andre A., to Lummus Company, The. Removal of quinoline insolubles from coal derived fractions. 4,292,170, Cl. 208-131.000.

Simpson Manufacturing Co., Inc.: *See—*
Gilb, Tyrell T., 4,291,996, Cl. 403-14.000.

Singer, Carl M.; and Ratkay, Edward J., to Commercial Shearing, Inc. Rotary impeller or motor with pressure balanced end plates. 4,292,013, Cl. 418-132.000.

Singer, Larry. Removable glass desk pad. 4,292,352, Cl. 428-14.000.

Singer, Mortimer. Dispenser for oil well treating chemicals. 4,291,763, Cl. 166-110.000.

Sinnreich, Manfred. Inflatable packing for surgical use having auxiliary intestinal supporting member. 4,291,687, Cl. 128-129.000.

Sipek, Ladislav: *See—*
Selander, Lennart; Fahlen, Lars; and Sipek, Ladislav, 4,292,493, Cl. 219-74.000.

Sipin, Anatole J.; and Carleton, Herbert R., to Anatole J. Sipin Company. Personal air sampler with electric motor driven by intermittent full-power pulses under control, between pulses, of motor's back electromotive force. 4,292,574, Cl. 318-331.000.

Sitarchuk, Alexei A.: *See—*
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A., 4,292,494, Cl. 219-76.130.

Sivachenko, Eugene W. Prefabricated building construction. 4,291,510, Cl. 52-90.000.

SKF Industries, Inc.: *See—*
Persson, Stig, 4,291,927, Cl. 308-121.000.

SKODA, oborovy podnik: *See—*
Roth, Zdenek; and Altmann, Josef, 4,292,259, Cl. 261-123.000.

SKW Trostberg Aktiengesellschaft: *See—*
Wolfsgruber, Friedrich; Kasel, Hans W.; Odendahl, Manfred H. A.; and Morsdorf, Wolfram W., 4,292,075, Cl. 75-130.00R.

Sladco, Inc.: *See—*
Cherry, Gary D., 4,291,598, Cl. 81-57.150.

Sladkoshteev, Vladimir T.: *See—*
Korytov, Vladimir A.; Maljushevsky, Pavel P.; Guly, Grigory A.; Shkatov, Alexandr S.; Sladkoshteev, Vladimir T.; Patanin, Ruslan V.; Dorokhov, Vasily I.; Klemeshov, Georgy A.; and Arkulis, Grigory E., 4,291,742, Cl. 164-501.000.

Slazas, John J., to Allis-Chalmers Corporation. Foot pedal arrangement for a motor vehicle. 4,291,778, Cl. 180-271.000.

Sledzieski, William L.: *See—*
Bosco, Peter M.; and Sledzieski, William L., 4,292,333, Cl. 426-335.000.

Sletzinger, Meyer: *See—*
Liu, Thomas M. H.; Reamer, Robert A.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,292,436, Cl. 560-148.000.

Sloan Valve Company: *See—*
Billeter, Henry R., 4,291,923, Cl. 303-23.00R.

Sluyts, Domien: *See—*
Denecker, Gabriel; Sluyts, Domien; Putseys, Roland; Van Herck, Willy; Claes, Ludo; and Spott, Georg, 4,292,043, Cl. 23-296.000.

Smart, Ethel D.: *See—*
Smart, Isaac W.; and Smart, Ethel D., 4,291,883, Cl. 273-163.00R.

Smart, Isaac W.; and Smart, Ethel D. Adjustable putter blade sight. 4,291,883, Cl. 273-163.00R.

Sminge, Poul E.; and Thoegersen, Svend I., to A/S Dantherm. Air drying apparatus of the condensation type. 4,291,542, Cl. 62-156.000.

Smith, Allan J., Jr. Split-singles stick for tennis courts. 4,291,875, Cl. 273-29.00B.

Smith, Glenn S., to Schlumberger Technology Corporation. Electromagnetic inspection tool for ferromagnetic casings. 4,292,588, Cl. 324-221.000.

Smith, James D.; and Paul, Richard. Filter and cooling apparatus for dry-cleaning systems. 4,292,174, Cl. 210-167.000.

Smith, Lewis R., to Burr-Brown Research Corporation. Capacitance coupled isolation amplifier and method. 4,292,595, Cl. 330-10.000.

Smith, Michael P.: *See—*
Blackburn, Martin J.; and Smith, Michael P., 4,292,077, Cl. 75-175.500.

Smith, Thor L.; and Weiche, William J., to International Business Machines Corporation. Tear resistant ribbon for non-impact printing. 4,291,994, Cl. 400-241.100.

SmithKline Corporation: *See—*
Ali, Fadia E.; Krell, Robert D.; and Snader, Kenneth M., 4,292,305, Cl. 424-45.000.

Smithlin, John R., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Manchester decoder. 4,292,626, Cl. 340-347.0DD.

Smock, Steven W.; and Adams, George W., to Emhart Industries, Inc. Circuit controller for anti-wrinkle control. 4,292,482, Cl. 200-38.00R.

Smorenberg, Dirk: *See—*
Koster, Hendrikus J.; Bik, Johannes T. J.; Clardey, Johannes G.; and Smorenberg, Dirk, 4,291,712, Cl. 131-339.000.

Snader, Kenneth M.: *See—*
Ali, Fadia E.; Krell, Robert D.; and Snader, Kenneth M., 4,292,305, Cl. 424-45.000.
Snell, Leonard S., to Rolls-Royce Limited. Shaft coupling. 4,292,001, Cl. 403-359.000.
Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Perazzoni, Pierluigi; and Bilancini, Luigi, 4,292,194, Cl. 252-400.00R.
Snipes, Wallace: *See—*
Keith, Alec D.; and Snipes, Wallace, 4,292,301, Cl. 424-28.000.
Keith, Alec D.; and Snipes, Wallace, 4,292,302, Cl. 424-28.000.
Keith, Alec D.; and Snipes, Wallace, 4,292,303, Cl. 424-28.000.
Socapex: *See—*
Badoz, Jean-Marie; and Merceron, Daniel, 4,291,935, Cl. 339-97.00R.
Societe Anonyme Automobiles Citroen: *See—*
Coatantiec, Alain, 4,291,909, Cl. 294-88.000.
Societe Anonyme de Telecommunications: *See—*
Baudot, Jean-Jacques, 4,291,937, Cl. 350-23.000.
S.A. PRB: *See—*
Jourquin, Lucien; and Du Prez, Eddie, 4,292,411, Cl. 521-51.000.
Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A. Societe Anonyme: *See—*
Perraud, Raymond J., 4,291,771, Cl. 173-106.000.
Societe d'Etudes Techniques et Commerciales d'Automation: *See—*
Dumont, Claude, 4,292,630, Cl. 340-573.000.
Societe Europeenne des Derives du Manganese, en abrege Sedema Societe Anonyme: *See—*
Welsh, Jay Y.; Picquet, Pierre C.; and Schyns, Pierre D., 4,292,282, Cl. 423-60.000.
Societe Generale pour l'Emballage: *See—*
Maupate, Jacques, 4,291,910, Cl. 294-95.000.
Societe Industrielle de Brevets et d'Etudes: *See—*
Bauer, Philippe, 4,291,860, Cl. 251-129.000.
Societe Nationale des Poudres et Explosifs: *See—*
Boileau, Sylvie L.; Caubere, Paul J.; Raynal, Serge F.; Lecolier, Serge L.; and N'Debeka, Gilberte N., 4,292,421, Cl. 526-220.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Mialon, Jacques, 4,292,368, Cl. 428-310.000.
Sodec, Frank, to H. Krantz GmbH & Co., Firma. Linear air outlet. 4,291,615, Cl. 98-40.00C.
Soeda, Naohiko: *See—*
Nakazato, Yoshio; Tanaka, Tomoo; Hashiguchi, Koichi; and Soeda, Naohiko, 4,292,097, Cl. 148-12.00C.
Sollish, Bruce D.: *See—*
Frei, Ephraim H.; and Sollish, Bruce D., 4,291,708, Cl. 128-734.000.
Soloway, Samuel B.: *See—*
Roman, Steven A.; and Soloway, Samuel B., 4,292,325, Cl. 424-304.000.
Solvay & Cie: *See—*
Berger, Eugene; and Derroitte, Jean-Louis, 4,292,200, Cl. 252-431.00C.
Son, Pyong N.: *See—*
Lai, John T.; and Son, Pyong N., 4,292,240, Cl. 260-239.30R.
Layer, Robert W.; and Son, Pyong N., 4,292,237, Cl. 260-45.8NW.
Sony Corporation: *See—*
Kishi, Yoshio, 4,292,557, Cl. 310-78.000.
Niimura, Tsutomu; Murakami, Kyoichi; and Yamakoshi, Akira, 4,292,597, Cl. 330-254.000.
Sooter, Matthew C., to Conoco, Inc. Processing high sulfur coal. 4,292,165, Cl. 208-8.0LE.
Sopino, Bruno: *See—*
Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno, 4,292,218, Cl. 260-22.0CB.
Sorensen, James R., to Georgia-Pacific Corporation. Container with locking lid. 4,291,830, Cl. 229-45.00R.
Sorenson Research Company, Inc.: *See—*
Todd, Robert J.; and Wonder, Terry M., 4,291,693, Cl. 128-214.00C.
Sotchenko, Vladimir P.: *See—*
Dudko, Daniil A.; Mozzhukhin, Anatoly A.; Breze, Vladimir V.; Kozlov, Anatoly E.; Grigoriev, Veniamin G.; Sotchenko, Vladimir P.; Maximovich, Boleslav I.; Budzan, Bogdan P.; and Zavodian, Vitaly V., 4,292,486, Cl. 219-9.500.
Soukup, Richard J.: *See—*
Johnson, Dannis R.; Foster, Elgin J.; and Soukup, Richard J., 4,292,661, Cl. 361-393.000.
Souriau & Compagnie: *See—*
Badoz, Jean-Marie; and Merceron, Daniel, 4,291,935, Cl. 339-97.00R.
Southgate, Peter D., to RCA Corporation. Inspection system for detecting defects in regular patterns. 4,292,672, Cl. 364-507.000.
Spaniol, John W.: *See—*
Wilson, John F.; Hoover, Edward D.; Hammond, Philip K.; Moshier, William A.; Woodell, Jack L.; Spaniol, John W.; Bowerman, John J.; Bieber, Larry C.; and Perlman, Marvin, 4,292,465, Cl. 178-3.000.
Spencer, Arthur T., to Mobil Oil Corporation. Cationic aqueous emulsion systems. 4,292,217, Cl. 260-18.00N.
Sperry Corporation: *See—*
Cools, Antoon S. P., 4,291,523, Cl. 56-94.000.
Lazarchik, Robert E.; and Roeder, Robert S., 4,292,638, Cl. 343-7.500.
McMahon, Donald H., 4,291,976, Cl. 356-150.000.
Scheuneman, James H., 4,292,674, Cl. 364-900.000.
Weber, Steven J.; and Rowland-Hill, E. W., 4,291,709, Cl. 130-27.00T.
Speyerer, Heinz: *See—*
Engmann, Gunther; Lepach, Werner; and Speyerer, Heinz, 4,292,114, Cl. 156-447.000.
Spie-Batignolles: *See—*
Clavier, Philippe, 4,292,136, Cl. 202-234.000.
Spitzer, Erlys C.; and Spitzer, Frank. Weatherproof panel enclosure. 4,291,817, Cl. 220-327.000.
Spitzer, Frank: *See—*
Spitzer, Erlys C.; and Spitzer, Frank, 4,291,817, Cl. 220-327.000.
Spott, Georg: *See—*
Denecker, Gabriel; Sluyts, Domien; Putseys, Roland; Van Herck, Willy; Claes, Ludo; and Spott, Georg, 4,292,043, Cl. 23-296.000.
Sprague Electric Company: *See—*
Bernard, Walter J., 4,292,148, Cl. 204-144.000.
Sprecker, Mark A.: *See—*
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,292,193, Cl. 252-174.110.
Squire, Edward N.; and Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Preparation of isobutyric acid and esters. 4,292,437, Cl. 560-233.000.
Srebrov, Bojidar M.: *See—*
Kyuchukov, Yanko P.; and Srebrov, Bojidar M., 4,291,580, Cl. 73-741.000.
SRI International: *See—*
Laine, Richard M., 4,292,242, Cl. 260-326.800.
Stagg, George A., Jr. Shot gun shell construction. 4,291,625, Cl. 102-449.000.
Stahl, Werner; Breuer, Uwe; Richter, Bernhard; Alstetter, Franz; Krappmann, Franz; and Schuster, Hans, to Krauss-Maffei Aktiengesellschaft. Pressurizable rotary filter. 4,292,177, Cl. 210-325.000.
Stamicarbon, B.V.: *See—*
Gerritsen, Leendert A.; and Scholten, Joseph J. F., 4,292,198, Cl. 252-428.000.
Stana, Regis R.: *See—*
Elikan, Leonard; Stana, Regis R.; and Ritchey, Robert W., 4,292,278, Cl. 423-8.000.
Standard Brands Incorporated: *See—*
Bosco, Peter M.; and Sledzieski, William L., 4,292,333, Cl. 426-335.000.
Standard-Knapp, Inc.: *See—*
Johnson, Lloyd D., 4,291,518, Cl. 53-491.000.
Standard Oil Co., The: *See—*
Bartek, Joseph P.; Cepulis, Rimoydas L.; and Grasselli, Robert K., 4,292,455, Cl. 585-320.000.
Isley, Ralph E., 4,292,228, Cl. 260-30.40A.
Kiikka, Oliver A., 4,292,456, Cl. 585-431.000.
Milberger, Ernest C.; and Wong, Eunice K. T., 4,292,203, Cl. 252-438.000.
Standard Oil Company (Indiana): *See—*
Beynet, Pierre A., 4,291,772, Cl. 175-5.000.
Grutsch, James F.; and Mallatt, Russell C., 4,292,176, Cl. 210-616.000.
Klotz, Marvin R., 4,292,457, Cl. 585-447.000.
Klotz, Marvin R., 4,292,458, Cl. 585-469.000.
Lee, Richard J.; Meyer, Delbert H.; and Senneke, Darrell M., 4,292,452, Cl. 568-881.000.
Wright, Robert M.; and Johncock, Allan W., 4,292,138, Cl. 203-2.000.
Stanley Electric Co.: *See—*
Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, 4,291,949, Cl. 350-349.000.
Staplin, Theodore R., Jr.: *See—*
Miller, Robert C.; Bradley, John J.; King, Richard L.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,292,668, Cl. 364-200.000.
Starcevic, Mihailo, to BBC Brown, Boveri & Company, Limited. Radially aerated disc rotor. 4,292,554, Cl. 310-58.000.
Stark, Kenneth R.: *See—*
Shoemaker, John J.; and Stark, Kenneth R., 4,291,422, Cl. 4-251.000.
Staub, Vincent M., Jr., to General Motors Corporation. Torque converter clutch and vibration damper. 4,291,790, Cl. 192-3.280.
Stauffer Chemical Company: *See—*
Walsh, Edward N.; and Hardy, Thomas A., 4,292,036, Cl. 8-182.000.
Stecher, Gunther: *See—*
Muller, Klaus; Maurer, Helmut; Dietz, Hermann; Friese, Karl-Hermann; Leibfried, Wolfgang; Stecher, Gunther; and Linder, Ernst, 4,292,158, Cl. 204-195.00S.
Stecklein, Gary L., to Deere & Company. Shaft lever coupling means. 4,292,002, Cl. 403-376.000.
Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. Deflection system and switched-mode power supply using a common ramp generator. 4,292,654, Cl. 358-158.000.
Steigerwald, Robert L.; Crouch, Keith E.; and Wilson, James W. A., to United States of America, Energy. Combination field chopper and battery charger. 4,292,578, Cl. 320-9.000.
Steinberg, Klaus; and Hoffmann, Gerhard, to Bayerische Motoren Werke Aktiengesellschaft. Device for counterbalancing a swivelable body part on a motor vehicle. 4,291,501, Cl. 49-386.000.
Steinberg, Richard A.: *See—*
Giallorenzi, Thomas G.; and Steinberg, Richard A., 4,291,939, Cl. 350-96.140.

Steiner, Alois, to Ruti Machinery Works Ltd. Multiple longitudinal traversing shed weaving apparatus. 4,291,729, Cl. 139-28.000.

Stepina, Jaroslav: *See—*
Auinger, Herbert; Bradler, Peter; Weppler, Rudolf; and Stepina, Jaroslav, 4,292,559, Cl. 310-206.000.

Stickel, Arloa: *See—*
Hansen, Robert N., 4,291,893, Cl. 280-507.000.

Stifano, Vincent A., Jr., to Veeder Industries Inc. Method of forming socket wrenches. 4,291,568, Cl. 72-356.000.

Stinson, John M.; and Burnell, James R., to Tennessee Valley Authority. Production of urea-ammonium polyphosphates from urea phosphate. 4,292,067, Cl. 71-29.000.

Stitzer, Steven N.: *See—*
Goldie, Harry; and Stitzer, Steven N., 4,292,607, Cl. 333-24.100.

Stoakes, Richard L. Structural assemblies. 4,291,511, Cl. 52-235.000.

Stobbe, Richard E.: *See—*
Cesarz, Michael R.; and Stobbe, Richard E., 4,292,577, Cl. 318-802.000.

Stoehr, Herbert M. Apparatus for providing taped coils of sheet material. 4,291,460, Cl. 29-820.000.

Stone, Walter H.; and Nostrand, William G., to Nelson Industries, Inc. Spin-on filter coalescer unit with flow reversing baffle assembly. 4,292,179, Cl. 210-443.000.

Stoodley III, Thomas J.: *See—*
Hill, Lawrence W.; Stoodley III, Thomas J.; and Malcolm, Ronald, 4,292,666, Cl. 364-104.000.

Storck, Friedrich: *See—*
Lang, Gusztav; Storck, Friedrich; and Seghezzi, Hans-Dieter, 4,291,608, Cl. 411-16.000.

Stork Repak B.V.: *See—*
Polderman, Pieter A., 4,291,733, Cl. 141-152.000.

Stormon, Lester T.: *See—*
Massey, Peyton L.; and Stormon, Lester T., 4,291,421, Cl. 3-12.600.

Straughan, Virgil E.; and Wainer, Eugene, to Horizons Research Incorporated. Gaseous plasma developing and etching process employing low voltage DC generation. 4,292,384, Cl. 430-5.000.

Strickland, Benjamin W. Solar furnace apparatus. 4,291,678, Cl. 126-438.000.

Strohman, Robert E.: *See—*
Wells, Warren W.; Strohman, Robert E.; and Wiese, Harold H., 4,291,611, Cl. 89-47.000.

Stupay, Lawrence J., to Bunker Ramo Corporation. Shear plane separable connector. 4,291,931, Cl. 339-45.00R.

Suarez, Ricardo; Chang, Oscar; and Adam, Vladimir, to Instituto Venezolano de Investigaciones Cientificas (IVIC). Dynamically programmable logic circuits. 4,292,548, Cl. 307-465.000.

Sudnishnikov, Boris V.; Kamensky, Veniamin V.; Varnello, Eduard P.; and Tupitsyn, Sergei K. Rock-breaking implement for percussive machines. 4,291,774, Cl. 175-417.000.

Sugie, Akihiko: *See—*
Ono, Keiichi; Sugie, Akihiko; Kawakami, Hajime; and Katsube, Junki, 4,292,432, Cl. 549-35.000.

Sugihara, Hideki: *See—*
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.

Sugita, Naomi: *See—*
Honda, Sinya; Komura, Takeshi; Sugita, Naomi; and Okamoto, Tatuya, 4,292,078, Cl. 75-176.000.

Sugiura, Katsuaki: *See—*
Yoshizawa, Toshio; Yoshida, Yoshiaki; and Sugiura, Katsuaki, 4,291,437, Cl. 19-112.000.

Sugiyama, Sen: *See—*
Sasaki, Masayoshi; Ishii, Yoshimi; Yoshida, Tomiharu; and Sugiyama, Sen, 4,292,133, Cl. 176-36.00R.

Sukoian, Nariman A.: *See—*
Frolov, Jury F.; Sukoian, Nariman A.; Proshkin, Ivan T.; and Basalaev, Anany M., 4,292,460, Cl. 13-14.000.

Suljak, George T.: *See—*
Faitani, Joseph J.; Austin, George W.; Chase, Terry J.; Suljak, George T.; and Misage, Robert J., 4,292,274, Cl. 422-197.000.

Sumi, Takao: *See—*
Namura, Shigekazu; and Sumi, Takao, 4,292,103, Cl. 156-230.000.

Sumita, Tadayuki: *See—*
Ito, Yasuro; Higuchi, Yoshiro; Mochida, Yutaka; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,292,351, Cl. 427-403.000.

Sumitomo Chemical Company, Limited: *See—*
Nishikuri, Masao; Takeshita, Akira; and Kenmochi, Hirohito, 4,292,247, Cl. 260-381.000.
Ono, Keiichi; Sugie, Akihiko; Kawakami, Hajime; and Katsube, Junki, 4,292,432, Cl. 549-35.000.

Sumitomo Heavy Industries, Ltd.: *See—*
Fujita, Kenji; Shibata, Yuji; Mikuni, Hisao; and Shibuya, Tsuneo, 4,292,137, Cl. 202-248.000.

Sumitomo, Hiroyuki, to Hisaka Works, Limited. Cross-current type plate heat exchanger. 4,291,759, Cl. 165-146.000.

Sumitomo Metal Industries, Inc.: *See—*
Marukawa, Katsukiyo; Anezaki, Syoji; and Masuda, Seiichi, 4,292,073, Cl. 75-60.000.

Sun Power Systems Inc.: *See—*
Minto, Wallace L., 4,291,755, Cl. 165-3.000.

Sun, Y. S. Edmund: *See—*
Chu, Hing C.; and Sun, Y. S. Edmund, 4,292,644, Cl. 357-21.000.

Suntech, Inc.: *See—*
Lyons, James E.; Hosler, Peter; and Suntech, Inc., 4,292,219, Cl. 260-29.6ME.

Suvorov, Gennady P.: *See—*
Anfilov, Igor V.; Ershov, Geny S.; Kaidoshko, Eduard A.; Remizov, Jury B.; Rozhenko, Anatoly L.; Suvorov, Gennady P.; and Scherbatenko, Boris G., 4,291,971, Cl. 355-14.00R.

Suzuki, Akira: *See—*
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; and Arai, Katsuhiko, 4,292,361, Cl. 428-215.000.

Suzuki, Masayuki: *See—*
Ito, Tadashi; Murakami, Hiroyasu; Suzuki, Masayuki; Yamamichi, Masayoshi; Sakurada, Nobuaki; and Shinoda, Nobuhiko, 4,291,960, Cl. 354-53.000.

Suzuki, Mikio; and Nishimura, Toshifumi, to Nissan Motor Company, Limited. Air-fuel ratio control system for an internal combustion engine. 4,291,659, Cl. 123-440.000.

Suzuki, Ryoshu: *See—*
Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya, Hitoshi, 4,292,417, Cl. 525-510.000.

Suzuki, Seiichi: *See—*
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,292,070, Cl. 71-96.000.

Suzuki, Tomohiro, to Hitachi, Ltd. Coupling mechanism of control rod for nuclear reactor. 4,292,131, Cl. 176-36.00C.

Suzuki, Yoshiki; Ikura, Hiroshi; and Yamashita, Gentaro, to Teijin Limited. Slow-releasing medical preparation to be administered by adhering to a wet mucous surface. 4,292,299, Cl. 424-16.000.

Svistunov, Igor A.: *See—*
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A., 4,292,494, Cl. 219-76.130.

Swanson, John L. Storage container. 4,291,826, Cl. 229-31.0FS.

Sweatt, Robert L., to Western Electric Company, Inc. Method and apparatus for locating telephones. 4,292,480, Cl. 179-175.20B.

Sweitzer, John D. Socket wrench. 4,291,425, Cl. 7-100.000.

Swift & Company: *See—*
Batts, Tom, 4,291,434, Cl. 17-11.300.

Szymski, Eugene J.: *See—*
Brilando, Frank P.; and Szymski, Eugene J., 4,291,872, Cl. 272-73.000.

Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, to Hitachi, Ltd. Multistage speed change gear system. 4,291,587, Cl. 74-363.000.

Tachikawa Spring Co. Ltd.: *See—*
Urai, Muneharu, 4,291,856, Cl. 248-429.000.

Taelman, Dennis L. Therapeutic heat and cosmetic applicator. 4,291,685, Cl. 128-24.100.

Taguchi, Yoshinobu: *See—*
Takahashi, Tetsuo; Taguchi, Yoshinobu; Tando, Shuichi; and Saito, Kenichi, 4,292,116, Cl. 156-566.000.

Tahbaz, Pirouz, to Schering Corporation. Phenyl-1,2,3,4-tetrahydrocarbazoles and use thereof. 4,292,323, Cl. 424-274.000.

Taisei Corporation: *See—*
Ito, Yasuro; Higuchi, Yoshiro; Mochida, Yutaka; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,292,351, Cl. 427-403.000.

Taiyo Kaken Company, Ltd.: *See—*
Nakao, Masaaki; and Shiiki, Zenya, 4,292,285, Cl. 423-210.000.

Takahashi, Tetsuo; Taguchi, Yoshinobu; Tando, Shuichi; and Saito, Kenichi, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Apparatus for mounting chip type circuit elements on a printed circuit board. 4,292,116, Cl. 156-566.000.

Takahashi, Tohru: *See—*
Kanbe, Junichiro; Toyono, Tsutomu; Hosono, Nagao; and Takahashi, Tohru, 4,292,387, Cl. 430-102.000.

Takahashi, Yohnosuke: *See—*
Wada, Minoru; Shinozaki, Fumiaki; Takahashi, Yohnosuke; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,292,393, Cl. 430-275.000.
Wada, Minoru; Shinozaki, Fumiaki; Takahashi, Yohnosuke; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,292,395, Cl. 430-299.000.

Takamizawa, Minoru: *See—*
Takeuchi, Satoshi; Akada, Masanori; Fujii, Hitoshi; Toida, Takashi; Takamizawa, Minoru; and Inoue, Yoshio, 4,292,397, Cl. 430-303.000.

Takano, Misayo, legal representative: *See—*
Uemoto, Yasuo; Togami, Shigenori; Takano, Tsumoru, deceased; Ono, Ichiro; and Kayama, Takashi, 4,292,235, Cl. 260-42.180.

Takano, Toshimasa, to Tokyo Shibaura Denki Kabushiki Kaisha. Photoconductive drum with paper layer attachment. 4,292,386, Cl. 430-63.000.

Takano, Tsumoru, deceased: *See—*
Uemoto, Yasuo; Togami, Shigenori; Takano, Tsumoru, deceased; Ono, Ichiro; and Kayama, Takashi, 4,292,235, Cl. 260-42.180.

Takase, Hiroshi; and Fujii, Toru, to Olympus Optical Co., Ltd. Gauss type lens system. 4,291,952, Cl. 350-471.000.

Takasu, Shinichiro, to VLSI Technology Research Association. Apparatus for measuring the distribution of irregularities on a mirror surface. 4,291,990, Cl. 356-445.000.

Takayama, Syuichi, to Olympus Optical Company, Ltd. Apparatus for endoscopic photography. 4,291,961, Cl. 354-62.000.

Takeda Chemical Industries, Ltd.: *See—*
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,292,309, Cl. 424-119.000.
Kondo, Koichi; Yoshida, Isamu; and Kobayashi, Takashi, 4,292,038, Cl. 23-230.00B.

Takeda, Renzo; Kurihara, Kunitoshi; and Uchikawa, Sadao, to Hitachi, Ltd. Boiling water type nuclear reactor. 4,292,128, Cl. 176-20.00R.

Takeshita, Akira: *See—*
Nishikuri, Masao; Takeshita, Akira; and Kenmochi, Hirohito, 4,292,247, Cl. 260-381.000.

Takeshita, Toru: *See—*
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,292,249, Cl. 260-397.200.

Takeuchi, Satoshi; Akada, Masanori; Fujii, Hitoshi; Toida, Takashi; Takamizawa, Minoru; and Inoue, Yoshio, to Dai Nippon Printing Co., Ltd.; and Shin-Etsu Chemical Co., Ltd. Method for preparing dry planographic plates with plasma. 4,292,397, Cl. 430-303.000.

Talres Development (N.A.) N.V.: *See—*
Latymer, Zdenek, 4,292,336, Cl. 426-548.000.

Tan, Tat S. Linear switching regulator. 4,292,581, Cl. 323-283.000.

Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nishihara, Motohisa; and Nagata, Takeo, to Hitachi, Ltd. Semiconductor strain gauge with elastic load plate. 4,292,618, Cl. 338-5.000.

Tanaka, Hiroshi; and Kato, Osamu, to NGK Spark Plug Co., Ltd. Ceramic materials for high-speed cutting. 4,292,049, Cl. 51-309.000.

Tanaka, Kentaro; Shoji, Jun'ichi; Kawamura, Yoshimi; Hattori, Teruo; Kondo, Eiji; Matsumoto, Kouichi; Yoshida, Tadashi; and Tsuji, Naoki, to Shionogi & Co., Ltd. Antibiotic PA-31088-IV and production thereof. 4,292,241, Cl. 260-245.20T.

Tanaka, Kouichi, to Nippon Electric Co., Ltd. Bipolar voltage detector comprising differential transistor. 4,292,552, Cl. 307-354.000.

Tanaka, Michio; Miura, Norio; and Shimiya, Keiji, to Kasei Optonix, Ltd. Process for manufacturing a radiographic intensifying screen. 4,292,107, Cl. 156-249.000.

Tanaka, Tadakazu: *See—*
Kawaguchi, Yosiyuki; Nishida, Takashi; Marukawa, Nobuaki; Tanaka, Tadakazu; and Kontani, Yoshinari, 4,291,600, Cl. 82-1.00C.

Tanaka, Takehiko; and Kanzawa, Masahide, to Kobe Steel, Limited. Rotor shaft sealing mechanism in synthetic resin kneading machines or extruders. 4,291,888, Cl. 277-65.000.

Tanaka, Takeshi: *See—*
Kojima, Hiroshi; Ito, Kunio; Akiyama, Masami; and Tanaka, Takeshi, 4,292,389, Cl. 430-169.000.

Tanaka, Tomoo: *See—*
Nakazato, Yoshio; Tanaka, Tomoo; Hashiguchi, Koichi; and Soeda, Naohiko, 4,292,097, Cl. 148-12.00C.

Tanaka, Toshiki: *See—*
Bando, Yoshihide; and Tanaka, Toshiki, 4,292,613, Cl. 335-128.000.

Tanaka, Yutaka; and Yatomi, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Wire electrode electric discharge machine with controlled electrical parameters. 4,292,491, Cl. 219-69.00W.

Tando, Shuichi: *See—*
Takahashi, Tetsuo; Taguchi Yoshinobu; Tando, Shuichi; and Saito, Kenichi, 4,292,116, Cl. 156-566.000.

Tanida, Seiichi: *See—*
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,292,309, Cl. 424-119.000.

Tanigawa, Nobuyoshi: *See—*
Fujimura, Kensuke; Yamamoto, Naomichi; Ogawa, Masahiro; and Tanigawa, Nobuyoshi, 4,291,549, Cl. 62-534.000.

Taniguchi, Nobuyuki: *See—*
Yuasa, Yoshio; Ishikawa, Norio; and Taniguchi, Nobuyuki, 4,291,979, Cl. 356-218.000.

Taniguchi, Yoshiko: *See—*
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.

Taniishi, Shinnosuke; and Kuge, Tsukasa, to Canon Kabushiki Kaisha. Process for producing negative-crowned roller. 4,291,505, Cl. 51-289.00R.

Tasis, Elizabeth A.: *See—*
Dikoff, Joseph K., 4,291,995, Cl. 401-175.000.

Tatsumi, Tetsuo, to Murata Manufacturing Co., Ltd. Variable capacitor. 4,292,660, Cl. 361-293.000.

Tauber, Oswald; Engelhardt, Gunther; Leitold, Matyas; and Schmidt, Gunther, to Boehringer Ingelheim GmbH. Antiphlogistic pharmaceutical compositions and method of use. 4,292,319, Cl. 424-250.000.

Tavel, Donald L.; and Beigel, Michael L., to Tavel, Donald L. Music synthesizer. 4,291,605, Cl. 84-1.260.

Taylor, Alexander P. Roaster tray. 4,291,616, Cl. 99-446.000.

Taylor, Dennis O.: *See—*
Reid, David L.; and Taylor, Dennis O., 4,292,670, Cl. 364-431.000.

Taylor, Gordon J., to Union Carbide Corporation. Method of impregnating a fibrous textile material with a plastic resin. 4,292,105, Cl. 156-242.000.

Tazaki, Takaharu: *See—*
Nozawa, Takamitsu; and Tazaki, Takaharu, 4,291,818, Cl. 220-335.000.

TDK Electronics: *See—*
Okamura, Masatoshi; and Shiba, Haruo, 4,291,800, Cl. 206-387.000.

Technicare Corporation: *See—*
Carlson, Roland W., 4,292,538, Cl. 250-367.000.

Teijin Limited: *See—*
Inata, Hiroo; Ogasawara, Makoto; Morinaga, Tsuto; and Horike, Akihiro, 4,292,151, Cl. 204-159.150.
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,292,249, Cl. 260-397.200.
Suzuki, Yoshiki; Ikura, Hiroshi; and Yamashita, Gentaro, 4,292,299, Cl. 424-16.000.

Tekron Licensing B.V.: *See—*
Hickman, Ronald P., 4,291,869, Cl. 269-139.000.

Telediffusion de France: *See—*
Macheboeuf, Guy R., 4,292,649, Cl. 358-22.000.

Teledyne Industries, Inc.: *See—*
Fisher, Richard L.; Wright, David J.; and Scheel, Randall, 4,291,753, Cl. 165-94.000.
Kerr, Ronald R.; Mullins, Keith M.; and Bowie, Bruce H., 4,292,629, Cl. 340-547.000.

Tenneco Chemicals Inc.: *See—*
Collins, John D.; and Wood, Donald A., 4,292,252, Cl. 260-429.700.

Tennessee Valley Authority: *See—*
Stinson, John M.; and Burnell, James R., 4,292,067, Cl. 71-29.000.

Terasaki, Masatosi: *See—*
Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, 4,291,587, Cl. 74-363.000.

Terasawa, Masatoshi: *See—*
Ogawa, Koichi; Tezuka, Shichigoro; Terasawa, Masatoshi; and Iwata, Shizuo, 4,292,329, Cl. 426-5.000.

Terry, Reese S.: *See—*
Geddes, Leslie A.; Bourland, Joe D.; and Terry, Reese S., 4,291,699, Cl. 178-419.00D.

Terui, Yohji: *See—*
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; Kitahara, Tohru; and Watanabe, Kenichi, 4,292,433, Cl. 556-479.000.

Tesch, Gunter, to Breveteam S.A. Patterned textile material. 4,292,367, Cl. 428-300.000.

Teshima, Toru: *See—*
Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, 4,291,949, Cl. 350-349.000.

Texaco Inc.: *See—*
Vartanian, Paul F.; and Biasotti, Joseph B., 4,292,047, Cl. 44-65.000.

Texas Instruments Incorporated: *See—*
Orcutt, John W., 4,291,717, Cl. 137-86.000.

Textron Inc.: *See—*
Chao, Chris C., 4,292,090, Cl. 134-2.000.

Tezuka, Shichigoro: *See—*
Ogawa, Koichi; Tezuka, Shichigoro; Terasawa, Masatoshi; and Iwata, Shizuo, 4,292,329, Cl. 426-5.000.

Thalmann, Dieter: *See—*
Schellenberg, Hans; Schenkel, Eduard; Schwander, Andreas; and Thalmann, Dieter, 4,291,529, Cl. 57-291.000.

Theodore, Ares N.; Pett, Robert A.; and Qaderi, S. Burhan A., to Ford Motor Company. Highly filled thermally conductive elastomers I. 4,292,223, Cl. 260-29.1SB.

Theodore, Ares N., to Ford Motor Company. Highly filled thermally conductive elastomers II. 4,292,224, Cl. 260-29.1SB.

Theodore, Ares N.; and Lemieux, Marvin A., to Ford Motor Company. Highly filled thermally conductive elastomers IV. 4,292,225, Cl. 260-29.1SB.

Thermionics Laboratory, Inc.: *See—*
Faria, Carl R., 4,291,861, Cl. 251-158.000.

Thermo King Corporation: *See—*
Johnson, Dannis R.; Foster, Elgin J.; and Soukup, Richard J., 4,292,661, Cl. 361-393.000.

Thoegersen, Svend I.: *See—*
Sminge, Poul E.; and Thoegersen, Svend I., 4,291,542, Cl. 62-156.000.

Thoemel, Frank: *See—*
Hoffmann, Werner; and Thoemel, Frank, 4,292,244, Cl. 260-345.100.

Thomas, Bernard K.: *See—*
Fray, Derek J.; and Thomas, Bernard K., 4,292,147, Cl. 204-118.000.

Thomas, Charles F. Adaptable stencil for different mimeograph machines. 4,291,621, Cl. 101-114.000.

Thompson, Harvey A.: *See—*
Simmons, Richard R.; and Thompson, Harvey A., 4,292,513, Cl. 250-205.000.

Thompson, Worthington J.; and Freeman, Peter A. Wind-powered impeller-mixer. 4,292,540, Cl. 290-55.000.

Thomson-CSF: *See—*
Henry, Raymond; and Simon, Jacques, 4,291,942, Cl. 350-96.200.

Thornton, Peter: *See—*
Cole, James E.; and Thornton, Peter, 4,291,702, Cl. 128-675.000.

Thrower, Stephen W.; Criss, George H.; and Kleeb, Thomas R., to Dresser Industries, Inc. Vibratable plastic refractory. 4,292,084, Cl. 501-107.000.

Thurston, Thomas R., to International Business Machines Corporation. Misfeed detector. 4,292,529, Cl. 250-561.000.

Tipper, Maynard J. G. Method and apparatus for forming clips. 4,291,561, Cl. 72-187.000.

Tobin, Leo W., Jr. Ceramic material processing. 4,292,262, Cl. 264-26.000.

Todd, Richard A., to United States of America, Energy. Compensated count-rate circuit for radiation survey meter. 4,292,539, Cl. 250-374.000.

Todd, Robert J.; and Wonder, Terry M., to Sorenson Research Company, Inc. Fluid metering device. 4,291,693, Cl. 128-214.00C.

Togami, Shigenori: *See*—
Uemoto, Yasuo; Togami, Shigenori; Takano, Tsumoru, deceased; Ono, Ichiro; and Kayama, Takashi, 4,292,235, Cl. 260-42.180.
Togei, Ryoiku, to VLSI Technology Research Association. Method of producing semiconductor devices by selective laser irradiation and oxidation. 4,292,091, Cl. 148-1.500.
Toho Aen Kabushiki Kaisha: *See*—
Tomii, Keishi; and Tsuchida, Hideyuki, 4,292,284, Cl. 423-112.000.
Toida, Takashi: *See*—
Takeuchi, Satoshi; Akada, Masanori; Fujii, Hitoshi; Toida, Takashi; Takamizawa, Minoru; and Inoue, Yoshio, 4,292,397, Cl. 430-303.000.
Tokico Ltd.: *See*—
Kato, Tetuo, 4,291,788, Cl. 188-322.170.
Toko, Inc.: *See*—
Ishii, Masanori; and Kameya, Kazuo, 4,292,544, Cl. 307-52.000.
Tokunaga, Norikazu: *See*—
Onda, Kenichi; and Tokunaga, Norikazu, 4,292,550, Cl. 307-252.00A.
Tokyo Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Takahashi, Tetsuo; Taguchi, Yoshinobu; Tando, Shuichi; and Saito, Kenichi, 4,292,116, Cl. 156-566.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Ohtomo, Fumio, 4,292,514, Cl. 250-214.00C.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kanto, Masaharu, 4,292,565, Cl. 313-407.000.
Kusakabe, Hiromi, 4,292,584, Cl. 323-316.000.
Takano, Toshimasa, 4,292,386, Cl. 430-63.000.
Yasumura, Hiroto, 4,292,598, Cl. 330-281.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Fujioka, Masahiko, 4,292,656, Cl. 360-97.000.
Tomaschewski, Horst: *See*—
Kuhn, Michael H.; and Tomaschewski, Horst, 4,292,471, Cl. 179-1.0SB.
Tomii, Keishi; and Tsuchida, Hideyuki, to Toho Aen Kabushiki Kaisha. Solvent extraction recovery process for indium. 4,292,284, Cl. 423-112.000.
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; and Furukawa, Yosio, to Hitachi, Ltd. Guide bearing device. 4,291,926, Cl. 308-73.000.
Tomita, Shimpei: *See*—
Tsunoda, Yoshitoshi; Tomita, Shimpei; and Miyazawa, Chihiro, 4,292,448, Cl. 568-456.000.
Tomotsu, Takeshi: *See*—
Ikeda, Tomoaki; Sigyoo, Masamiti; Ikeda, Sadaharu; Toshida, Satoshi; and Tomotsu, Takeshi, 4,292,388, Cl. 430-162.000.
Tomy Kogyo Co., Inc.: *See*—
Ikeda, Masaki, 4,291,490, Cl. 46-251.000.
Tone Commanders Systems, Inc.: *See*—
Hill, Stephen R.; De Pinto, Victor M.; and Gillen, John D., 4,292,475, Cl. 179-99.00A.
Topsil A/S: *See*—
De Leon, Noel, 4,292,487, Cl. 219-10.430.
Totten, David S.; and Worringer, Thomas J., to Allis-Chalmers Corporation. Vehicle seat suspension. 4,291,857, Cl. 248-559.000.
Tournier, Herve: *See*—
Regnault, Alain; Sachetto, Jean-Pierre; Tournier, Herve; Hamm, Thomas; and Armanet, Jean-Michel, 4,292,089, Cl. 127-1.000.
Townsley, Philip M.: *See*—
Coulthard, T. Lionel; Townsley, Philip M.; and Saben, Hugh S., 4,292,328, Cl. 426-2.000.
Toyo Kagaku Kabushiki Kaisha: *See*—
Hirata, Mituto, 4,292,113, Cl. 156-428.000.
Toyo Kogyo Co., Ltd.: *See*—
Muramoto, Hisao, 4,291,899, Cl. 280-806.000.
Toyono, Tsutomu: *See*—
Kanbe, Junichiro; Toyono, Tsutomu; Hosono, Nagao; and Takahashi, Tohru, 4,292,387, Cl. 430-102.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ito, Sadayoshi, 4,291,786, Cl. 188-218.00A.
Komiyama, Yoshiro; Kondo, Katsumi; Fuwa, Yoshio; Matsui, Akira; Miyazaki, Shoji; and Hasegawa, Tokushiro, 4,292,074, Cl. 75-122.000.
Minami, Yoriteru, 4,291,897, Cl. 280-802.000.
Miyagi, Hideo; and Nakano, Jiro, 4,291,656, Cl. 123-320.000.
Nakamura, Norihiko; Nakanishi, Kiyoshi; and Kato, Takashi, 4,291,662, Cl. 123-661.000.
Wakizaka, Hiroshi; Shinohara, Hiroshi; Otsuka, Yasuhiro; and Matsumoto, Shinichi, 4,292,157, Cl. 204-195.00S.
Yamakawa, Yoshio, 4,291,655, Cl. 123-306.000.
Tran Quang, Dang: *See*—
Gabbay, Emile; Tran Quang, Dang; and Lafitte, Andre, 4,292,563, Cl. 313-56.000.
Transcale A.B.: *See*—
Odlen, Lars; and Hansson, Anders, 4,292,467, Cl. 179-1.00D.
Transport, Felix. Display device. 4,291,798, Cl. 206-45.240.
Travaglio, Dalny: *See*—
Ginn, Le Roy D.; Ginn, Le Royce S.; Morris, John C.; and Travaglio, Dalny, 4,291,832, Cl. 236-49.000.
Travis, Jonathan A.: *See*—
Petersen, Walter A.; Travis, Jonathan A.; and Badia, Frank A., 4,292,377, Cl. 428-675.000.
Treiber, Fritz F.: *See*—
Warner, Norbert C.; and Treiber, Fritz F., 4,291,516, Cl. 53-219.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Process for hydrogenation of 2,6,6-trimethyl cyclohexene derivatives, products produced thereby and organoleptic uses of said products. 4,292,447, Cl. 568-378.000.
Trimmel, Herwig, to Siemens Aktiengesellschaft. Modulation current control of laser diodes. 4,292,606, Cl. 332-7.510.
Trio Kabushiki Kaisha: *See*—
Wada, Takeshi; Ienaka, Masanori; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,292,549, Cl. 307-247.00R.
Triosops, Inc.: *See*—
Wells, Daniel R.; and Packo, Joseph J., 4,292,568, Cl. 315-111.400.
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A. Electric spark building-up of metal on the working surface of rolls. 4,292,494, Cl. 219-76.130.
Trzoska, Peter R., to Ford Motor Company. Hydraulic tappet. 4,291,652, Cl. 123-90.570.
Tschunt, Edgar, to Siemens Aktiengesellschaft. Diagnostic radiology apparatus for producing layer images of an examination subject. 4,292,525, Cl. 250-445.00T.
Tsuchida, Hideyuki: *See*—
Tomii, Keishi; and Tsuchida, Hideyuki, 4,292,284, Cl. 423-112.000.
Tsugaya, Hitoshi: *See*—
Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya, Hitoshi, 4,292,417, Cl. 525-510.000.
Tsuji, Naoki: *See*—
Tanaka, Kentaro; Shoji, Jun'ichi; Kawamura, Yoshimi; Hattori, Teruo; Kondo, Eiji; Matsumoto, Kouichi; Yoshida, Tadashi; and Tsuji, Naoki, 4,292,241, Cl. 260-245.20T.
Tsujimura, Masatoshi, to Nippon Denshoku Kogyo Co., Ltd. Dual beam photometer with rotating filter plate. 4,291,985, Cl. 356-408.000.
Tsunoda, Yoshitoshi; Tomita, Shimpei; and Miyazawa, Chihiro, to Mitsubishi Chemical Industries Ltd. Process for the hydroformylation of olefins. 4,292,448, Cl. 568-456.000.
Tsuruta, Hideki: *See*—
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,292,249, Cl. 260-397.200.
Tucel Industries, Inc.: *See*—
Lewis, John C., Jr., 4,291,431, Cl. 15-159.00R.
Tucker, Cleveland T. Door car starter. 4,291,653, Cl. 123-179.0BG.
Tully, Clay E.: *See*—
O'Neill, Brian S.; and Tully, Clay E., 4,291,451, Cl. 29-235.000.
Tunison, Donald E., III, to Cabot Corporation. Process for the production of finely-divided metal and metalloid oxides. 4,292,290, Cl. 423-336.000.
Tupitsyn, Sergei K.: *See*—
Sudnishnikov, Boris V.; Kamensky, Veniamin V.; Varnello, Eduard P.; and Tupitsyn, Sergei K., 4,291,774, Cl. 175-417.000.
Turbine Components Corporation: *See*—
Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T., 4,291,448, Cl. 29-156.80B.
Turner, James W.; and Mikofalvy, Bela K., to B. F. Goodrich Company, The. Emulsion polymerization process for producing vinyl dispersion resins. 4,292,420, Cl. 526-212.000.
Turner, James W.: *See*—
Huddleston, George R., Jr.; Turner, James W.; and Konter, Kenneth D., 4,292,424, Cl. 528-500.000.
Tutco, Inc.: *See*—
Gebarowski, Peter D.; and Henry, Sam W., 4,292,504, Cl. 219-542.000.
Tyree, Vance C.: *See*—
United States of America, National Aeronautics and Space Administration; Wu, Chialin; and Tyree, Vance C., 4,292,634, Cl. 343-5.0CM.
Ube Industries, Ltd.: *See*—
Fujimura, Kensuke; Yamamoto, Naomichi; Ogawa, Masahiro; and Tanigawa, Nobuyoshi, 4,291,549, Cl. 62-534.000.
Itatani, Hiroshi; Shiotani, Akinori; and Yokota, Akiyoshi, 4,292,435, Cl. 560-96.000.
Uchida, Tatsuo: *See*—
Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, 4,291,949, Cl. 350-349.000.
Uchikawa, Sadao: *See*—
Takeda, Renzo; Kurihara, Kunitoshi; and Uchikawa, Sadao, 4,292,128, Cl. 176-20.00R.
Ud Din, Zia: *See*—
Cardenas, Carlos G.; and Ud Din, Zia, 4,292,454, Cl. 585-16.000.
Cardenas, Carlos G.; and Ud Din, Zia, 4,292,459, Cl. 585-641.000.
Uematsu, Shinji: *See*—
Ishiwata, Mamoru; Uematsu, Shinji; Ozaki, Kazuo; and Ishiyama, Masashi, 4,292,349, Cl. 427-335.000.
Uemoto, Yasuo; Togami, Shigenori; Takano, Tsumoru, deceased (by Takano, Misayo, legal representative); Ono, Ichiro; and Kayama, Takashi, to Mitsui Toatsu Chemicals, Inc. Fiber glass reinforced resin compositions. 4,292,235, Cl. 260-42.180.
Ulvestad, Edward A.; and Harris, Charles M., to Flex Kleen Corp. Top removal support for dust collector bags. 4,292,057, Cl. 55-302.000.
Underman Greeman Berger Limited: *See*—
Pond, Alan R., 4,292,003, Cl. 403-407.000.
Union Carbide Corporation: *See*—
Bergsten, Victor E.; Eardley, Edward P.; and Halvorson, Thomas G., 4,291,634, Cl. 110-235.000.
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Weast, Norman J. Archery bow mount for telescopic sight. 4,291,469, Cl. 33-265.000.

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Werner, Frank D.; Kleven, Lowell A.; and Greig, Richard C., to Park Energy Company. Glazing for solar heat collectors with provisions for thermal expansion of the glazing. 4,291,684, Cl. 126-450.000.

Wesch, Ludwig; and Meyer, Adolf, to Heidelberger Zement Aktiengesellschaft. Multi-layer board. 4,292,364, Cl. 428-286.000.

Wesselhoft, Robert D.; and Ryan, Daniel F., to Exxon Research & Engineering Co. Integrated catalytic coal devolatilization and steam gasification process. 4,292,048, Cl. 48-197.00R.

Westenskow, Dwayne R.: *See*—
Bowman, Robert J.; and Westenskow, Dwayne R., 4,291,692, Cl. 128-214.00E.

Western Electric Company, Inc.: *See*—
Dalrymple, Philip W.; Hyle, Michael J.; Myers, Daryl L.; and Wright, James G., Jr., 4,291,841, Cl. 242-18.00A.
Sweatt, Robert L., 4,292,480, Cl. 179-175.20B.

Western Litho Plate & Supply Co.: *See*—
Eime, Lester O.; and Parker, Edward H., 4,292,396, Cl. 430-302.000.

Westinghouse Electric Corp.: *See*—
Barry, Robert F., 4,292,129, Cl. 176-24.000.
Engel, Joseph C., 4,292,570, Cl. 315-360.000.
Flick, Carl; and Ying, Sui-Chun, 4,292,558, Cl. 310-194.000.
Goldie, Harry; and Stitzer, Steven N., 4,292,607, Cl. 333-24.100.
Grundy, Brian R., 4,291,865, Cl. 266-227.000.
Kothmann, Richard E., 4,292,379, Cl. 429-17.000.
Redden, George H., 4,291,757, Cl. 165-104.310.
Weinert, Robert W.; and de Klerk, John, 4,292,608, Cl. 333-141.000.
Wilson, James H., 4,292,590, Cl. 324-226.000.

Wheelabrator-Frye Inc.: *See*—
Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., 4,291,509, Cl. 51-432.000.

Whirlpool Corporation: *See*—
Mason, Anthony, 4,291,556, Cl. 68-23.700.

White, Clark W.: *See*—
Ownby, Gary W.; White, Clark W.; and Zehner, David M., 4,292,093, Cl. 148-4.000.

White, Rodney V., to Owens-Illinois, Inc. Double-walled glass solar energy collector. 4,291,680, Cl. 126-443.000.

Whitehurst, Darrell D.: *See*—
Derbyshire, Francis J.; and Whitehurst, Darrell D., 4,292,164, Cl. 208-8.0LE.
Derbyshire, Francis J.; Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,292,168, Cl. 208-107.000.

Whitemore, Christopher E.; and Carrillo, Robert M., to Rohr Industries, Inc. Method of manufacturing of honeycomb noise attenuation structure and the structure resulting from the method. 4,292,356, Cl. 428-116.000.

Whiteside, George D.: *See*—
Johnson, Bruce K.; and Whiteside, George D., 4,291,965, Cl. 354-195.000.

Whitesides, Michael: *See*—
Hoefer, Peter S.; and Whitesides, Michael, 4,292,161, Cl. 204-299.00R.

Whitlath Co.: *See*—
Whitman, Archie E., Sr.; and Lathrops, Donald D. W., 4,291,452, Cl. 29-235.000.

Whitman, Archie E., Sr.; and Lathrops, Donald D. W., to Whitlath Co. Tension relieving and bowstring replacing device for compound bow. 4,291,452, Cl. 29-235.000.

Whitney, Walter D. Straightening apparatus for vehicle bodies. 4,291,570, Cl. 72-447.000.

Wick, Arnold: *See*—
Dazzi, Joachim; Jost, Max; and Wick, Arnold, 4,292,232, Cl. 260-40.00P.

Wiegel, Jurgen K. W.: *See*—
Ljungdahl, Lars G.; and Wiegel, Jurgen K. W., 4,292,406, Cl. 435-42.000.
Ljungdahl, Lars G.; and Wiegel, Jurgen K. W., 4,292,407, Cl. 435-161.000.

Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Isochroman musk compounds and organoleptic uses thereof. 4,292,193, Cl. 252-174.110.

Wiese, Harold H.: *See*—
Wells, Warren W.; Strohman, Robert E.; and Wiese, Harold H., 4,291,611, Cl. 89-47.000.

Wildey Firearms Company, Inc.: *See*—
Hillberg, Robert L., 4,291,481, Cl. 42-70.00A.

Wilhelm, Dieter: *See*—
Kuhnert, Volker; and Wilhelm, Dieter, 4,292,564, Cl. 313-318.000.

Willeitner, Eberhard, to Maschinenfabrik Augsburg-Nurnberg AG. Swirl tube apparatus for separating gas or isotope mixtures. 4,292,058, Cl. 55-348.000.

Willem, Michel, to Ceraver. Method of fixing a metal strength member on a non-metal part. 4,291,741, Cl. 164-9.000.

Williams, Andrew S., to C. R. Bard, Inc. Nebulizer and associated heater. 4,291,838, Cl. 239-138.000.

Williams, Ernest E.; and Brennan, William M., to Rockwell International Corporation. Automatic insertion universal work holding system. 4,291,867, Cl. 269-43.000.

Williams, Harvey: *See*—
Fast, John; and Williams, Harvey, 4,291,602, Cl. 83-745.000.

Williams, Peter S., to Warner-Lambert Company. Water-soluble shaving aid for razor blades. 4,291,463, Cl. 30-346.530.

Williams, Wilmore; and Luksas, Anthony J., to Beatrice Foods Co. Bread leavening yeast. 4,292,330, Cl. 426-20.000.

Williamson, Dennis F., to General Electric Company. Electrical propulsion process and system for a traction vehicle with an on-board source of power. 4,292,531, Cl. 290-14.000.

Williamson, Warren G., to Robertshaw Controls Company. Method of making a stem seat for a piston and cylinder type thermal device. 4,291,449, Cl. 29-157.10R.

Wilson, James H., to Westinghouse Electric Corp. Magnetometer apparatus with detector immobilized in wax. 4,292,590, Cl. 324-226.000.

Wilson, James W. A.: *See*—
Steigerwald, Robert L.; Crouch, Keith E.; and Wilson, James W. A., 4,292,578, Cl. 320-9.000.

Wilson, Joe C.: *See*—
Davis, Pauls; Maxwell, Jerrold F.; and Wilson, Joe C., 4,292,190, Cl. 252-75.000.

Wilson, John F.; Hoover, Edward D.; Hammond, Philip K.; Moshier, William A.; Woodell, Jack L.; Spaniol, John W.; Bowerman, John J.; Bieber, Larry C.; and Perlman, Marvin, to Frederick Electronics Corporation. Distributed processing telex exchange. 4,292,465, Cl. 178-3.000.

Wilson, Mahlon T. Heat reclamation for shower baths, sinks, and other fluid receiving vessels. 4,291,423, Cl. 4-598.000.

Wilson, Stewart W., to Polaroid Corporation. Audiovisual system with improved moving light pointer. 4,291,954, Cl. 353-42.000.

Wilson, William B.: *See*—
Basili, Robert A.; and Wilson, William B., 4,291,801, Cl. 206-387.000.

Wiltron Company: *See*—
Oldfield, William W.; and Bier, Larry J., 4,291,936, Cl. 339-177.00R.

Windsor Communications Group, Inc.: *See—*
Perales, Raul, 4,291,803, Cl. 206-443.000.
Winters, Robert J.: *See—*
Kenney, Eugene J.; Lazzarini, Donald J.; and Winters, Robert J., 4,292,230, Cl. 260-33.2EP.
Wirostko, Emil: *See—*
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Wisconsin Alumni Research Foundation: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; and LeVan, Leon W., 4,292,250, Cl. 260-397.200.
Witte, Earl R.: *See—*
Zylka, Kenneth R.; and Witte, Earl R., 4,292,180, Cl. 210-496.000.
Witte, Josef: *See—*
Rothbuhr, Lothar; and Witte, Josef, 4,292,291, Cl. 423-450.000.
Wohrle, Rudolf; and Kohler, Robert, to Alois Kober KG. Torsion-bar wheel support for trailer. 4,291,895, Cl. 280-723.000.
Wojcik, Karl: *See—*
Franchina, Anthonino A., 4,291,833, Cl. 237-2.00B.
Wolf, Bernard A. Thermal inverter. 4,291,751, Cl. 165-45.000.
Wolf, Leslie R.: *See—*
Novak, Ronald W.; and Wolf, Leslie R., 4,292,220, Cl. 260-23.0AR.
Wolfsgruber, Friedrich; Kasel, Hans W.; Odendahl, Manfred H. A.; and Morsdorf, Wolfram W., to SKW Trostberg Aktiengesellschaft; and Halbergerhutte GmbH. Slow fade inocculant and a process for the inocculation of melted cast iron. 4,292,075, Cl. 75-130.00R.
Wollum, James E.; and Rawlings, Robert L., to Burroughs Corporation. Autonomous data communications subsystem. 4,292,669, Cl. 364-200.000.
Wolske, Eugene H., to Bemis Company, Inc. Method of providing net bags with wicketing flaps. 4,292,033, Cl. 493-221.000.
Wombold, Harry A. E.: *See—*
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Wonder, Terry M.: *See—*
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Wong, Eunice K. T.: *See—*
Milberger, Ernest C.; and Wong, Eunice K. T., 4,292,203, Cl. 252-438.000.
Wong, Raphael C.: *See—*
Buckler, Robert T.; Burd, John F.; and Wong, Raphael C., 4,292,425, Cl. 536-4.000.
Wood, Donald A.: *See—*
Collins, John D.; and Wood, Donald A., 4,292,252, Cl. 260-429.700.
Wood, John R.: *See—*
Karnis, Alkibiadis; and Wood, John R., 4,292,122, Cl. 162-28.000.
Wood, Louis L., to W. R. Grace & Co. Hydrophilic, fabric softener foam compositions and method of making. 4,292,412, Cl. 521-107.000.
Woodard, Kenneth E., Jr.: *See—*
Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,292,159, Cl. 204-237.000.
Woodell, Jack L.: *See—*
Wilson, John F.; Hoover, Edward D.; Hammond, Philip K.; Moshier, William A.; Woodell, Jack L.; Spaniol, John W.; Bowerman, John J.; Bieber, Larry C.; and Perlman, Marvin, 4,292,465, Cl. 178-3.000.
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Gigliotti, Michael F. X.; Jackson, Melvin R.; Henry, Michael F.; Woodford, David A.; Yang, Sherwin S.; and Bruch, Charles A., 4,292,076, Cl. 75-170.000.
Work, Gerald. Daylight developing apparatus for photographic film. 4,291,968, Cl. 354-313.000.
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Martin, Lawrence L.; and Worm, Manfred, 4,292,245, Cl. 260-346.220.
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Totten, David S.; and Worringer, Thomas J., 4,291,857, Cl. 248-559.000.
Worsham, James R., III. Absorption heat pump. 4,291,545, Cl. 62-238.300.
Wright, David J.: *See—*
Fisher, Richard L.; Wright, David J.; and Scheel, Randall, 4,291,753, Cl. 165-94.000.
Wright, James G., Jr.: *See—*
Dalrymple, Philip W.; Hyle, Michael J.; Myers, Daryl L.; and Wright, James G., Jr., 4,291,841, Cl. 242-18.00A.
Wright, Mary J.: *See—*
Elliott, Margaret L.; and Wright, Mary J., 4,292,213, Cl. 260-2.300.
Wright, Robert M.; and Johncock, Allan W., to Standard Oil Company (Indiana). Energy balance control for fractionation tower. 4,292,138, Cl. 203-2.000.
Wu, Chialin: *See—*
United States of America, National Aeronautics and Space Administration; Wu, Chialin; and Tyree, Vance C., 4,292,634, Cl. 343-5.0CM.
Wulf, Hurst E. Hub cap for vehicle wheels. 4,291,921, Cl. 301-37.0AT.
Wulff, Hermann, to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Apparatus for extracting the entrails and/or cleaning the belly cavity of fish. 4,291,436, Cl. 17-59.000.
Wyoming Mineral Corp.: *See—*
Elikan, Leonard; Stana, Regis R.; and Ritchey, Robert W., 4,292,278, Cl. 423-8.000.
Wyslotsky, Ihor. Impulse heat generation and sealer apparatus. 4,292,118, Cl. 156-583.200.
Xerox Corporation: *See—*
Brooke, Edric R., 4,291,973, Cl. 355-71.000.
Silverberg, Morton, 4,291,974, Cl. 355-76.000.
Yale, Boyd R., to Island Creek Coal Co. Shuttle car. 4,291,777, Cl. 180-24.060.
Yamada, Tsuneo: *See—*
Wada, Takeshi; Ienaka, Masanori; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,292,549, Cl. 307-247.00R.
Yamakawa, Yoshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine. 4,291,655, Cl. 123-306.000.
Yamakoshi, Akira: *See—*
Niimura, Tsutomu; Murakami, Kyoichi; and Yamakoshi, Akira, 4,292,597, Cl. 330-254.000.
Yamamichi, Masayoshi: *See—*
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Yamamoto, Kazuyuki; and Ohkoshi, Seiei, to Nippon Telegraph and Telephone Public Corporation. Speech channel switching networks suitable for use in combination with electronic key telephone sets. 4,292,476, Cl. 179-99.00R.
Yamamoto, Naomichi: *See—*
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Yamasaki, Hitoshi; and Iwawaki, Yasutaka, to Sharp Kabushiki Kaisha. Error detection in a digital printer employing type wheels. 4,291,620, Cl. 101-99.000.
Yamashita, Gentaro: *See—*
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Yamashita, Sadahiko: *See—*
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Yamori, Akio: *See—*
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Yanagawa, Hitoshi; Konishi, Motofumi; Ando, Yoshio; and Kashiwagi, Kazuo, to Canon Kabushiki Kaisha. Web winding apparatus. 4,291,843, Cl. 242-57.000.
Yang, Sherwin S.: *See—*
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Yasukawa, Akio: *See—*
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Yasumura, Hiroto, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic gain control circuit. 4,292,598, Cl. 330-281.000.
Yatomi, Takeshi: *See—*
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Yeakley, Lester M. Displacement sensing device having capacitance transduction element. 4,292,632, Cl. 340-870.370.
Yeda Research & Development Co. Ltd.: *See—*
Frei, Ephraim H.; and Sollish, Bruce D., 4,291,708, Cl. 128-734.000.
Yie, Gene G.; and Bevan, Thomas M., to Institute of Gas Technology. Pipeline flow restrictor and process. 4,291,727, Cl. 138-93.000.
Ying, Sui-Chun: *See—*
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Yokota, Akiyoshi: *See—*
Itatani, Hiroshi; Shiotani, Akinori; and Yokota, Akiyoshi, 4,292,435, Cl. 560-96.000.
Yokota, Seizo. Articulator. 4,292,026, Cl. 433-69.000.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Frequency selection circuit. 4,292,468, Cl. 179-1.00D.
Yokoyama, Takao: *See—*
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Yokoyama, Tohei: *See—*
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Yokoyama, Toshiaki; Hara, Akira; and Okuyama, Takeshi, to Hitachi, Ltd. Motoring control for hydraulic pump-turbine. 4,292,533, Cl. 290-40.00B.
Yonekura, Hiroto: *See—*
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Yorita, Eiichi: *See—*
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Yoshida, Hiroshi, to Yoshida Kogyo K.K. Molded coupling element assembly. 4,291,440, Cl. 24-205.16R.
Yoshida, Isamu: *See—*
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Yoshida, Kasumi: *See—*
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Yoshida, Masako: *See*—
Ohashi, Takashi; Okuyama, Toru; Suzuki, Akira; Arai, Katsuhiko; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; Sakata, Ryozo; Sugihara, Hideki; Dobashi, Masashi; and Ohwada, Hirobumi, 4,292,353, Cl. 428-211.000.

Yoshida, Satoshi: *See*—
Ikeda, Tomoaki; Sigyoo, Masamiti; Ikeda, Sadaharu; Yoshida, Satoshi; and Tomotsu, Takeshi, 4,292,388, Cl. 430-162.000.
Wada, Minoru; Shinozaki, Fumiaki; Takahashi, Yohnosuke; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,292,393, Cl. 430-275.000.
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Yoshida, Tadashi: *See*—
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Yoshida, Yoshiaki: *See*—
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Yoshii, Takashi: *See*—
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Yoshimi, Akiro: *See*—
Ootsuka, Fumio; Ninomiya, Morimasa; Maehara, Norio; and Yoshimi, Akiro, 4,291,749, Cl. 165-27.000.

Yoshino Kogyosho Co., Ltd.: *See*—
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Yoshioka, Mitihiro: *See*—
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Yoshizawa, Toshio; Yoshida, Yoshiaki; and Sugiura, Katsuaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Combing roller utilized for an open-end spinning machine. 4,291,437, Cl. 19-112.000.

Young Dental Manufacturing Co.: *See*—
Richmond, George E., 4,292,027, Cl. 433-127.000.

Young, Earlwood. Illuminated fishing float. 4,291,484, Cl. 43-17.500.

Youngquist, Robert J.: *See*—
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Yuasa, Yoshio; Ishikawa, Norio; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Device for measuring light under ambient light and/or flash light and a method therefor. 4,291,979, Cl. 356-218.000.

Yumde, Yasufumi; and Furuhata, Takashi, to Hitachi, Ltd. Method of receiving a video signal. 4,292,652, Cl. 358-138.000.

Zahid, Abduz, to Greer Hydraulics, Incorporated. Accumulator device having safety charging port. 4,291,726, Cl. 138-30.000.

Zahnradfabrik Friedrichshafen, Aktiengesellschaft: *See*—
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Meyerle, Michael; and Ehrlinger, Friedrich, 4,291,592, Cl. 74-687.000.

Zappen, Hans-Wilhelm: *See*—
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Zehner, David M.: *See*—
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Zehner, Lee R.: *See*—
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Vartuli, James C.; and Zehner, Lee R., 4,292,202, Cl. 252-435.000.

Zeisler, Kurt. Crash-helmet. 4,291,418, Cl. 2-410.000.

Zeller, Norbert: *See*—
Lindner, Tassilo; Engelsberger, Georg; Zeller, Norbert; and Riedle, Rudolf, 4,292,434, Cl. 556-479.000.

Zemlyakova, Valentina P. Vaccine and method for prophylaxis and treatment of clostridioses of animals and poultry. 4,292,307, Cl. 424-92.000.

Zenith Radio Corporation: *See*—
Hendrickson, Melvin C., 4,292,650, Cl. 358-123.000.

Zettl, Herbert: *See*—
Bock, Gerd; Zettl, Herbert; Zappen, Hans-Wilhelm; and Zimmermann, Friedrich, 4,292,653, Cl. 358-140.000.

Zheleznov, Jury M.: *See*—
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Zherebtsov, Valery N.: *See*—
Trishevsky, Igor S.; Vorontsov, Nikolai M.; Jurchenko, Anatoly B.; Korobeinik, Vladimir F.; Zherebtsov, Valery N.; Svistunov, Igor A.; Rudjuk, Sergei I.; Marin, Vladimir S.; Bruskov, Viktor N.; Krupenik, Vitaly N.; Sitarchuk, Alexei A.; Bondarenko, Alexandr D.; Schekin, Vadim M.; and Baldakova, Iraida A., 4,292,494, Cl. 219-76.130.

Ziemba, Richard T.; Kinzel, Joseph A.; and Egtvedt, Myron D., to General Electric Company. Electrical fuze with a plurality of modes of operation. 4,291,627, Cl. 102-265.000.

Ziemek, Peter: *See*—
Hennig, Hans J.; Ziemek, Peter; and Schellmann, Erhard, 4,292,255, Cl. 260-453.0AR.

Zimmer USA, Inc.: *See*—
Hanrahan, James R.; and Levine, Richard G., 4,292,263, Cl. 264-46.900.

Zimmermann, Friedrich: *See*—
Bock, Gerd; Zettl, Herbert; Zappen, Hans-Wilhelm; and Zimmermann, Friedrich, 4,292,653, Cl. 358-140.000.

Zimmermann, Ulrich; and Pilwat, Gunter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Mass and a method of preparing same of living cells of organisms for adsorbing metal ions from a physiological solution, and employment of the mass for enriching metals. 4,292,408, Cl. 435-173.000.

Zlotek, Thaddeus F.: *See*—
Charchian, Loris J.; Emmons, Donald O.; and Zlotek, Thaddeus F., 4,291,795, Cl. 192-113.00B.

ZM "Cherno More": *See*—
Kyuchukov, Yanko P.; and Srebrov, Bojidar M., 4,291,580, Cl. 73-741.000.

Zodrow, Rudolf; and Hoveler, Egon, to Jagenberg Werke AG. Glue roller in a labeling machine. 4,292,117, Cl. 156-578.000.

Zuiderwijk, Jacobus J. M.: *See*—
Davies, David R.; Zuiderwijk, Jacobus J. M.; and Hagelaars, Adrianus M. P. M., 4,291,766, Cl. 166-276.000.

Zylka, Kenneth R.; and Witte, Earl R., to Meridian Industries Inc. Milk filter sock. 4,292,180, Cl. 210-496.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF SEPTEMBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, John A.: *See*—
Narasimhan, Mandayam J.; and Anderson, John A., Re. 30,753, Cl. 435-68.000.

Arvin Industries, Inc.: *See*—
Maxey, Alexander R., Re. 30,756, Cl. 360-84.000.

Cardiac Resuscitator Corporation: *See*—
Diack, Archibald W.; Welborn, Warren S.; and Rullman, Robert G., Re. 30,750, Cl. 128-419.00D.

Castelli, Renato, to Samsonite Corporation. Tidy box made entirely of polypropylene. Re. 30,751, Cl. 220-339.000.

Diack, Archibald W.; Welborn, Warren S.; and Rullman, Robert G., to Cardiac Resuscitator Corporation. Cardiac resuscitator and monitoring apparatus. Re. 30,750, Cl. 128-419.00D.

Du Pont de Nemours, E. I., and Company: *See*—
Hammer, Clarence F.; and Sinclair, Harold K., Re. 30,754, Cl. 525-379.000.

Ethyl Corporation: *See*—
Lindsay, Kenneth L.; and Kobetz, Paul, Re. 30,755, Cl. 562-583.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Itoh, Masumi; Kamiya, Takashi; and Hagiwara, Daijiro, Re. 30,752, Cl. 260-463.000.

Hagiwara, Daijiro: *See*—
Itoh, Masumi; Kamiya, Takashi; and Hagiwara, Daijiro, Re. 30,752, Cl. 260-463.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. Re. 30,749, Cl. 101-111.000.

Hammer, Clarence F.; and Sinclair, Harold K., to Du Pont de Nemours, E. I., and Company. Process for the preparation of graft copolymers. Re. 30,754, Cl. 525-379.000.

Itoh, Masumi; Kamiya, Takashi; and Hagiwara, Daijiro, to Fujisawa Pharmaceutical Co., Ltd. Oxime carbonates. Re. 30,752, Cl. 260-463.000.

Kamiya, Takashi: *See*—
Itoh, Masumi; Kamiya, Takashi; and Hagiwara, Daijiro, Re. 30,752, Cl. 260-463.000.

Kobetz, Paul: *See*—
Lindsay, Kenneth L.; and Kobetz, Paul, Re. 30,755, Cl. 562-583.000.

Lindsay, Kenneth L.; and Kobetz, Paul, to Ethyl Corporation. Process for the preparation of alkali-metal salts of carboxyalkoxy succinates. Re. 30,755, Cl. 562-583.000.

Maxey, Alexander R., to Arvin Industries, Inc. Method and apparatus for video signal recording. Re. 30,756, Cl. 360-84.000.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., Re. 30,749, Cl. 101-111.000.

Narasimhan, Mandayam J.; and Anderson, John A., to University of Minnesota, The Regents of the. Process for the large scale production of human growth hormone by serial secondary suspension culture. Re. 30,753, Cl. 435-68.000.

Rullman, Robert G.: *See*—
Diack, Archibald W.; Welborn, Warren S.; and Rullman, Robert G., Re. 30,750, Cl. 128-419.00D.

Samsonite Corporation: *See*—
Castelli, Renato, Re. 30,751, Cl. 220-339.000.

Sinclair, Harold K.: *See*—
Hammer, Clarence F.; and Sinclair, Harold K., Re. 30,754, Cl. 525-379.000.

University of Minnesota, The Regents of the: *See*—
Narasimhan, Mandayam J.; and Anderson, John A., Re. 30,753, Cl. 435-68.000.

Welborn, Warren S.: *See*—
Diack, Archibald W.; Welborn, Warren S.; and Rullman, Robert G., Re. 30,750, Cl. 128-419.00D.

LIST OF DESIGN PATENTEES

Abe, Takeshi: *See*—
Takahashi, Akira; Fujimori, Shunji; and Abe, Takeshi, 260,988, Cl. D14-5.000.

Adickes, Fred: *See*—
Birdsall, John; Bretschger, Edward B.; Adickes, Fred; and Hellenthal, Ronald, 261,017, Cl. D21-142.000.

Airway Industries, Inc.: *See*—
Davis, Michael, 260,947, Cl. D3-71.000.

American Home Products Corporation: *See*—
Schnarr, Randall T., 260,959, Cl. D32-49.000.

American Optical Corporation: *See*—
Armbruster, John T., 261,033, Cl. D24-17.000.
Armbruster, John T., 261,034, Cl. D24-17.000.

Andersson, Lars, to HAFA Fabriks AB. Light fixture housing. 261,056, 9-29-81, Cl. D26-85.000.

Armbruster, John T., to American Optical Corporation. Bilirubin concentration analyzer. 261,033, 9-29-81, Cl. D24-17.000.

Armbruster, John T., to American Optical Corporation. Medical instrument housing. 261,034, 9-29-81, Cl. D24-17.000.

Asaki, James T.; and MacKenzie, William G., to International Telephone and Telegraph Corporation. Camera with integrated flash. 260,997, 9-29-81, Cl. D16-06.000.

Aulenti, Gae, to Knoll International, Inc. Seat or similar article. 260,950, 9-29-81, Cl. D6-73.000.

Aurora Products Canada Ltd.: *See*—
Vandenbrink, Antonie, 261,018, Cl. D21-143.000.

Baffo, Charles M., to Mobil Oil Corporation. Combined service station building and canopy. 261,044, 9-29-81, Cl. D25-33.000.

Bandini-Buti, Luigi; and Del Corno, Marco, to Societa Italiana Telecomunicazioni Siemens S.p.A. Telephone set. 260,991, 9-29-81, Cl. D14-53.000.

Berkline Corporation, The: *See*—
Long, Stapleton, 260,954, Cl. D6-177.000.

Birdsall, John; Bretschger, Edward B.; Adickes, Fred; and Hellenthal, Ronald, to Louis Marx & Co., Inc. Combined toy vehicle and steering device therefor. 261,017, 9-29-81, Cl. D21-142.000.

Bitvai, Tivadar. Child's wash basin. 261,028, 9-29-81, Cl. D23-58.000.

Bowls, Thurman: *See*—
Wotowiec, Joseph P.; and Bowls, Thurman, 261,049, Cl. D26-26.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,050, Cl. D26-26.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,057, Cl. D26-93.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,058, Cl. D26-93.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,059, Cl. D26-93.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,060, Cl. D26-93.000.

Bowman Construction Supply, Inc.: *See*—
Bowman, William E., 261,045, Cl. D25-74.000.
Bowman, William E., 261,046, Cl. D25-74.000.

Bowman, William E., to Bowman Construction Supply, Inc. Expansion joint sealing strip for roadway joints and the like. 261,045, 9-29-81, Cl. D25-74.000.

Bowman, William E., to Bowman Construction Supply, Inc. Expansion joint sealing strip assembly for roadways and the like. 261,046, 9-29-81, Cl. D25-74.000.

Boyter, Mogens, to Dansk Pressalit A/S. Combined toilet seat and cover, or similar article. 261,029, 9-29-81, Cl. D23-71.000.

Bretschger, Edward B.: *See*—
Birdsall, John; Bretschger, Edward B.; Adickes, Fred; and Hellenthal, Ronald, 261,017, Cl. D21-142.000.

Brown, Gary. Desk top file. 261,011, 9-29-81, Cl. D19-90.000.

Canon Kabushiki Kaisha: *See*—
Miura, Yuzo; and Matsuda, Mutsuhide, 261,000, Cl. D16-42.000.

Carr, Harold F., Jr.; and Humphries, David F., to Dover Corporation/-Ernest Holmes Division. Cover for wrecker booms. 260,981, 9-29-81, Cl. D12-14.000.

Catte, Pierre, to Cibie Projecteurs. Headlight. 261,051, 9-29-81, Cl. D26-29.000.

Chambers, Richard F. Asphalt plant control house. 261,035, 9-29-81, Cl. D25-22.000.

Chambers, Richard F. Asphalt plant control house. 261,036, 9-29-81, Cl. D25-22.000.

Chambers, Richard F. Asphalt plant control house. 261,038, 9-29-81, Cl. D25-22.000.

Chambers, Richard F. Asphalt plant control house. 261,039, 9-29-81, Cl. D25-22.000.

Chambers, Richard F. Asphalt plant control house. 261,040, 9-29-81, Cl. D25-22.000.

Chambers, Richard F. Asphalt plant control house. 261,041, 9-29-81, Cl. D25-22.000.

Chambers, Richard F. Asphalt plant control house. 261,042, 9-29-81, Cl. D25-22.000.

Chambers, Richard F. Asphalt plant control house. 261,043, 9-29-81, Cl. D25-32.000.

Cibie Projecteurs: *See—*
Catte, Pierre, 261,051, Cl. D26-29.000.

Ciganko, David J., to Quaker Oats Company, The. Rolling toy. 261,020, 9-29-81, Cl. D21-150.000.

Clipson, Stuart A.: *See—*
Munch, Emil L.; and Clipson, Stuart A., 261,069, Cl. D99-44.000.

CMF Mattress Company: *See—*
Paripovich, Michael D.; and Kendall, Donald R., 260,951, Cl. D6-79.000.

Coca-Cola Company, The: *See—*
Cornett, Donald F., 260,996, Cl. D15-116.000.

Cornett, Donald F., to Coca-Cola Company, The. Dispenser cabinet. 260,996, 9-29-81, Cl. D15-116.000.

Curtis, Eugene E. Inflatable balloon merry-go-round toy. 261,016, 9-29-81, Cl. D21-84.000.

Dansk Pressalit A/S: *See—*
Boyter, Mogens, 261,029, Cl. D23-71.000.

Davis, Michael, to Airway Industries, Inc. Luggage case. 260,947, 9-29-81, Cl. D3-71.000.

Davis, Robert P.: *See—*
Katz, Ira R.; and Davis, Robert P., 260,948, Cl. D3-71.000.

Del Corno, Marco: *See—*
Bandini-Buti, Luigi; and Del Corno, Marco, 260,991, Cl. D14-53.000.

DeMars, Donald A., to Lefkowitz, Leroy M., a part interest. Wall or partition hung name plate/coat hook. 261,013, 9-29-81, Cl. D20-42.000.

DesMarais, Stephen D. Serving tray. 260,956, 9-29-81, Cl. D7-38.000.

Dinh Van, Jean. Wristwatch. 260,970, 9-29-81, Cl. D10-39.000.

Dover Corporation/Ernest Holmes Division: *See—*
Carr, Harold F., Jr.; and Humphries, David F., 260,981, Cl. D12-14.000.

Ehlebracht, Horst: *See—*
Emmerling, Oskar H.; and Ehlebracht, Horst, 260,976, Cl. D10-114.000.

Emmerling, Oskar H.; and Ehlebracht, Horst, to OSRAM GmbH. Automotive emergency lamp. 260,976, 9-29-81, Cl. D10-114.000.

Ethicon, Inc.: *See—*
Schuler, Michael; Mandel, Harvey B.; and Studer, John E., 260,955, Cl. D6-186.000.

Everett, Richard C. Brake shoe. 260,983, 9-29-81, Cl. D12-180.000.

Farnam Companies, Inc.: *See—*
Lindley, Donald C., 261,025, Cl. D22-18.000.

Feinberg, Martin; and MacKenzie, William G., to International Telephone and Telegraph Corporation. Phone book telephone. 260,992, 9-29-81, Cl. D14-53.000.

Fleck Manufacturing Company: *See—*
Moylan, John, 260,985, Cl. D13-30.000.

Ford, Harry R.; and Yoshihashi, Yasuo, to Formica Corporation. Laminate sheet. 261,065, 9-29-81, Cl. D92-1.00R.

Formica Corporation: *See—*
Ford, Harry R.; and Yoshihashi, Yasuo, 261,065, Cl. D92-1.00R.

Fresard, Marcel, to Mefina S.A. Sewing machine. 260,995, 9-29-81, Cl. D15-70.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
Klose, Odo, 261,027, Cl. D23-32.000.

Fujimori, Shunji: *See—*
Takahashi, Akira; Fujimori, Shunji; and Abe, Takeshi, 260,988, Cl. D14-5.000.

Furukawa, Masaaki; Nishibayashi, Michiko; and Onozaki, Noboru, to Hitachi, Ltd. Video tape recorder. 260,987, 9-29-81, Cl. D14-2.000.

Garstan Corporation: *See—*
Rimmler, William F., 260,977, Cl. D11-4.000.

General Electric Company: *See—*
Wiley, Emmett H., 261,061, Cl. D26-134.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,049, Cl. D26-26.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,050, Cl. D26-26.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,057, Cl. D26-93.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,058, Cl. D26-93.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,059, Cl. D26-93.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 261,060, Cl. D26-93.000.

Giannotti, Vincent, Jr.; Kapper, Henry; and Sabella, Edward J., to International Business Machines Corp. Typewriter or the like. 261,002, 9-29-81, Cl. D18-1.000.

Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Connector for wood members. 260,964, 9-29-81, Cl. D8-373.000.

Goettner, Michael K.; and Plummer, James E., to Owens-Illinois, Inc. Stopper. 260,969, 9-29-81, Cl. D9-439.000.

Gomez, Francine, to Waterman, S.A. Pen. 261,009, 9-29-81, Cl. D19-49.000.

HAFA Fabriks AB: *See—*
Andersson, Lars, 261,056, Cl. D26-85.000.

Hall, Peter J. Microfiche reader. 260,998, 9-29-81, Cl. D16-14.000.

Harrison, Jerry W.; Koncak, James D.; and Kline, Frank E. Vacuum mounted bracket for electronic equipment or the like. 260,965, 9-29-81, Cl. D8-373.000.

Hartmann Luggage Company: *See—*
Katz, Ira R.; and Davis, Robert P., 260,948, Cl. D3-71.000.

Hechler, Valentine, IV, to Injecto Mold, Inc. Hose reel. 260,962, 9-29-81, Cl. D8-359.000.

Hellenthal, Ronald: *See—*
Birdsall, John; Bretschger, Edward B.; Adickes, Fred; and Hellenthal, Ronald, 261,017, Cl. D21-142.000.

Henkels, Walter. Pocket torch. 261,052, 9-29-81, Cl. D26-46.000.

Hirano, Toru, to Tomy Kogyo Co., Inc. Toy trackway. 261,019, 9-29-81, Cl. D21-143.000.

Hitachi, Ltd.: *See—*
Furukawa, Masaaki; Nishibayashi, Michiko; and Onozaki, Noboru, 260,987, Cl. D14-2.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 260,986, Cl. D13-99.000.
Takahashi, Akira; Fujimori, Shunji; and Abe, Takeshi, 260,988, Cl. D14-5.000.

Hoskins, William F. Seat for skateboard. 261,022, 9-29-81, Cl. D21-227.000.

Humphries, David F.: *See—*
Carr, Harold F., Jr.; and Humphries, David F., 260,981, Cl. D12-14.000.

Ichikawa, Kaname, to Modern Royal Co., Ltd. Lighter or the like. 261,062, 9-29-81, Cl. D27-36.000.

Ichikawa, Shinpei; and Welch, Robert A., to Texas Instruments Incorporated. Case for an electronic calculator. 261,005, 9-29-81, Cl. D18-7.000.

Imanishi Flexible Tube Mfg. Co., Ltd.: *See—*
Nishikawa, Hideo, 260,958, Cl. D7-94.000.

Impulse Merchandising Limited: *See—*
White, Christopher J. V., 261,012, Cl. D20-10.000.

Injecto Mold, Inc.: *See—*
Hechler, Valentine, IV, 260,962, Cl. D8-359.000.

Insulation Sales, Co.: *See—*
Ward, Bruce K., 261,031, Cl. D23-163.000.

International Business Machines Corp.: *See—*
Giannotti, Vincent, Jr.; Kapper, Henry; and Sabella, Edward J., 261,002, Cl. D18-1.000.
Williams, Roger C., 260,990, Cl. D14-105.000.

International Telephone and Telegraph Corporation: *See—*
Asaki, James T.; and MacKenzie, William G., 260,997, Cl. D16-06.000.
Feinberg, Martin; and MacKenzie, William G., 260,992, Cl. D14-53.000.

Iseda, Takeshi: *See—*
Koga, Keisaku; and Iseda, Takeshi, 261,026, Cl. D23-2.000.

Itoh, Kunio, to Pentel Kabushiki Kaisha. Pen or similar article. 261,010, 9-29-81, Cl. D19-51.000.

Jinbo, Katsumi; and Sakamoto, Junichi, to Sharp Corporation. Cash register. 261,003, 9-29-81, Cl. D18-4.000.

Jinbo, Katsumi; and Sakamoto, Junichi, to Sharp Corporation. Cash register. 261,004, 9-29-81, Cl. D18-4.000.

John J. Madison Company, Inc.: *See—*
Santa Eulalia, Jesus A. C.; and Santa Eulalia, Javier B. C., 260,978, Cl. D11-158.000.

Jonsson, Ralph E. Automobile wheel cover. 260,984, 9-29-81, Cl. D12-209.000.

Kapper, Henry: *See—*
Giannotti, Vincent, Jr.; Kapper, Henry; and Sabella, Edward J., 261,002, Cl. D18-1.000.

Katz, Ira R.; and Davis, Robert P., to Hartmann Luggage Company. Luggage. 260,948, 9-29-81, Cl. D3-71.000.

Kauffman, Sylvia M., to Procter & Gamble Company, The. Continuous sheet paper or similar article. 261,064, 9-29-81, Cl. D59-2.00B.

Kawano, Takeyoshi; and Nishimoto, Teruyuki, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 260,993, 9-29-81, Cl. D14-70.000.

Keck, Karl M. Razor holder. 261,063, 9-29-81, Cl. D28-44.000.

Kendall, Donald R.: *See—*
Paripovich, Michael D.; and Kendall, Donald R., 260,951, Cl. D6-79.000.

King, Harold. Solar panel. 261,030, 9-29-81, Cl. D23-72.000.

Kline, Frank E.: *See—*
Harrison, Jerry W.; Koncak, James D.; and Kline, Frank E., 260,965, Cl. D8-373.000.

Klose, Odo, to Fricdrich Grohe Armaturenfabrik GmbH & Co. Spout for a shower head or the like. 261,027, 9-29-81, Cl. D23-32.000.

Knoll International, Inc.: *See—*
Aulenti, Gae, 260,950, Cl. D6-73.000.

Knopp, Arthur A.: *See—*
Marucci, N. Dominic; and Knopp, Arthur A., 261,032, Cl. D24-12.000.

Koga, Keisaku; and Iseda, Takeshi, to Sekisui Koji Kabushiki Kaisha. Storage tank for liquids or the like. 261,026, 9-29-81, Cl. D23-2.000.

Koncak, James D.: *See—*
Harrison, Jerry W.; Koncak, James D.; and Kline, Frank E., 260,965, Cl. D8-373.000.

Kosaka, Hideki: *See—*
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 260,986, Cl. D13-99.000.

Kretz, Edward J., to Owens-Illinois, Inc. Bottle. 260,966, 9-29-81, Cl. D9-349.000.

Lam, Yanta H. T., to Meyer Aluminum Ltd. Fire alarm. 260,975, 9-29-81, Cl. D10-106.000.

Lambert, Lloyd J., Sr. Physical exerciser. 261,021, 9-29-81, Cl. D21-196.000.

LaViolette, Paul A. Target pistol or similar article. 261,024, 9-29-81, Cl. D22-1.000.

Lawing, Edward, to Reliance Electric Co. Weighing scale. 260,973, 9-29-81, Cl. D10-91.000.

Leehaug, David J., to Maremont Corporation. Ratchet wrench handle. 260,961, 9-29-81, Cl. D8-107.000.

Lefkowitz, Leroy M.: *See—*
DeMars, Donald A., 261,013, Cl. D20-42.000.

Leonardi, Gaetano. Necktie for formal attire. 260,945, 9-29-81, Cl. D2-343.000.

Leonardi, Gaetano. Necktie for formal attire. 260,946, 9-29-81, Cl. D2-343.000.

Lesser, N. Lewis. Sampling depth bob. 260,974, 9-29-81, Cl. D10-101.000.

Lindley, Donald C., to Farnam Companies, Inc. Mouse trap. 261,025, 9-29-81, Cl. D22-18.000.

Littlefield, Richard. Temperature control apparatus. 260,971, 9-29-81, Cl. D10-50.000.

Long, Leonard L. Modular building unit. 261,047, 9-29-81, Cl. D25-91.000.

Long, Stapleton, to Berkline Corporation, The. Table. 260,954, 9-29-81, Cl. D6-177.000.

Lotherington, Bruce, to Teal Patents Limited. Ablution unit. 261,068, 9-29-81, Cl. D99-25.000.

Louis Marx & Co., Inc.: *See—*
Birdsall, John; Bretschger, Edward B.; Adickes, Fred; and Hellenthal, Ronald, 261,017, Cl. D21-142.000.

Lucas Industries Limited: *See—*
Price, Clifford D., 261,048, Cl. D26-24.000.

M. Kamenstein, Inc.: *See—*
Urich, Joy C., 260,957, Cl. D7-60.000.

M & R Seal Press Co., Inc.: *See—*
Wall, Alexander C.; and Sculler, Leonard H., 261,006, Cl. D18-15.000.

MacKenzie, William G.: *See—*
Asaki, James T.; and MacKenzie, William G., 260,997, Cl. D16-06.000.
Feinberg, Martin; and MacKenzie, William G., 260,992, Cl. D14-53.000.

Malia, John G., Jr. Telescoping plant stake. 260,960, 9-29-81, Cl. D8-1.000.

Mandel, Harvey B.: *See—*
Schuler, Michael; Mandel, Harvey B.; and Studer, John E., 260,955, Cl. D6-186.000.

Maremont Corporation: *See—*
Leehaug, David J., 260,961, Cl. D8-107.000.

Marucci, N. Dominic; and Knopp, Arthur A., to Syntex (U.S.A.) Inc. Dental handpiece. 261,032, 9-29-81, Cl. D24-12.000.

Matsuda, Mutsuhide: *See—*
Miura, Yuzo; and Matsuda, Mutsuhide, 261,000, Cl. D16-42.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kawano, Takeyoshi; and Nishimoto, Teruyuki, 260,993, Cl. D14-70.000.

McElwain, Diane M., to Procter & Gamble Company, The. Nonwoven sheet material. 261,066, 9-29-81, Cl. D92-1.00E.

McElwain, Diane M., to Procter & Gamble Company, The. Nonwoven sheet material. 261,067, 9-29-81, Cl. D92-1.00C.

McGourty, Michael J., to Pye Electronics Products Limited. Microphone. 260,989, 9-29-81, Cl. D14-12.000.

Mefina S.A.: *See—*
Fresard, Marcel, 260,995, Cl. D15-70.000.

Megna, Salvatore J. Hair brush. 260,949, 9-29-81, Cl. D4-35.000.

Merry, Carl A., to Schaefer Marine, Inc. Marine block. 260,963, 9-29-81, Cl. D8-360.000.

Meyer Aluminum Ltd.: *See—*
Lam, Yanta H. T., 260,975, Cl. D10-106.000.

Michaels, Dennis C.; and Michaels, John W. Viewing and angling device for ice fishing. 261,001, 9-29-81, Cl. D16-48.000.

Michaels, John W.: *See—*
Michaels, Dennis C.; and Michaels, John W., 261,001, Cl. D16-48.000.

Miura, Yuzo; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Camera with strobo. 261,000, 9-29-81, Cl. D16-42.000.

Mizejewski, Theodore C., to National Blank Book Company, Inc. Sheet lifter for a loose leaf ring binder. 261,008, 9-29-81, Cl. D19-32.000.

Mobil Oil Corporation: *See—*
Baffo, Charles M., 261,044, Cl. D25-33.000.

Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, to Hitachi, Ltd. Semiconductor. 260,986, 9-29-81, Cl. D13-99.000.

Modern Royal Co., Ltd.: *See—*
Ichikawa, Kaname, 261,062, Cl. D27-36.000.

Moylan, John, to Fleck Manufacturing Company. Cord reel. 260,985, 9-29-81, Cl. D13-30.000.

Munch, Emil L.; and Clipson, Stuart A., to Nestier Corporation. Multilevel bakery tray. 261,069, 9-29-81, Cl. D99-44.000.

Murakami, Gen: *See—*
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 260,986, Cl. D13-99.000.

National Blank Book Company, Inc.: *See—*
Mizejewski, Theodore C., 261,008, Cl. D19-32.000.

NCR Corporation: *See—*
Passer, Barry E.; and Sculley, George A., 261,007, Cl. D18-26.000.

Nestier Corporation: *See—*
Munch, Emil L.; and Clipson, Stuart A., 261,069, Cl. D99-44.000.

Nishibayashi, Michiko: *See—*
Furukawa, Masaaki; Nishibayashi, Michiko; and Onozaki, Noboru, 260,987, Cl. D14-2.000.

Nishikawa, Hideo, to Imanishi Flexible Tube Mfg. Co., Ltd. Double well slow cooker. 260,958, 9-29-81, Cl. D7-94.000.

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60 4,292,145
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4,292,160
299 R 4,292,161
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304 4,292,163

CLASS 206

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219 4,291,799
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4,291,801
409 4,291,802
443 4,291,803
509 4,291,804
563 4,291,805
620 4,291,806
626 4,291,807

CLASS 208

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4,292,165
59 4,292,166
66 4,292,167
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131 4,292,170
164 4,292,171

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668 4,291,808

CLASS 210

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167 4,292,174
192 4,292,175
325 4,292,177
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443 4,292,179
496 4,292,180
616 4,292,176
638 4,292,181

CLASS 211

69.5 4,291,809
89 4,291,810
205 4,291,811
207 4,291,812

CLASS 215

252 4,291,813

CLASS 219

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10.43 4,292,487
10.55 D 4,292,488
10.71 4,292,489
69 P 4,292,490
69 W 4,292,491
73 4,292,492
74 4,292,493
76.13 4,292,494
125.12 4,292,495
126 4,292,496
130.51 4,292,497
288 4,292,498
308 4,292,499
345 4,292,500
413 4,292,501
483 4,292,502
535 4,292,503
542 4,292,504
553 4,292,505

CLASS 220

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243 4,291,816
327 4,291,817
335 4,291,818
339 Re.30,751

CLASS 221

298 4,291,819

CLASS 222

70 4,291,820
153 4,291,821

CLASS 224

257 4,291,822
310 4,291,823

CLASS 225

2 4,291,824

CLASS 226

18 4,291,825

CLASS 229

31 FS 4,291,826
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41 B 4,291,828
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92 GA 4,292,508
92 MP 4,292,509
145 R 4,292,510
454 4,292,511

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CLASS 237

2 B 4,291,833
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CLASS 239

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289 4,291,839

CLASS 242

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78.7 4,291,845
84.2 G 4,291,846
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147 4,291,852

CLASS 246

271 4,291,854

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CLASS 249

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383 4,292,248
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397.3 4,292,251
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CLASS 269

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CLASS 273

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73 F 4,291,876
86 B 4,291,877
86 R 4,291,878
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129 L 4,291,880
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804 4,291,898
806 4,291,899

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40 R 4,292,534
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CLASS 294

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CLASS 303

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114 4,292,546
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322 4,292,561
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640 4,292,576
802 4,292,577

CLASS 320

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CLASS 322

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CLASS 323

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CLASS 324

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CLASS 329

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CLASS 330

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94.5 L 4,292,601
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870.39 4,292,633

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96.15 4,291,940
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286 4,291,945
302 4,291,946
336 4,291,947
340 4,291,948
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CLASS 353

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53 4,291,960
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293 4,291,967
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338 4,291,983
350 4,291,984
408 4,291,985
410 4,291,986
431 4,291,987
437 4,291,988
440 4,291,989
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CLASS 357

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15 4,292,643
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29 4,292,645
38 4,292,646
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CLASS 358

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22 4,292,649
123 4,292,650
135 4,292,651
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CLASS 360

40 4,292,655
84 Re.30,756
97 4,292,656
98 4,292,657

CLASS 361

93 4,292,658
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293 4,292,660
393 4,292,661

CLASS 362

17 4,292,662
97 4,292,663
120 4,292,664

CLASS 363

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CLASS 364

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200 4,292,667
4,292,668
4,292,669
431 4,292,670
433 4,292,671
507 4,292,672
509 4,292,673
900 4,292,674

CLASS 365

156 4,292,675
222 4,292,676
4,292,677

CLASS 366

159 4,291,991

CLASS 367

102 4,292,678
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CLASS 368

187 4,292,680
280 4,292,681
289 4,292,682

CLASS 369

203 4,291,886

CLASS 370

104 4,292,683

CLASS 371

38 4,292,684

CLASS 400

124 4,291,992
144.2 4,291,993
241.1 4,291,994

CLASS 401

175 4,291,995

CLASS 403

14 4,291,996
24 4,291,997
263 4,291,998
297 4,291,999
320 4,292,000
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CLASS 405

203 4,292,004
219 4,292,005

CLASS 409

131 4,292,006

CLASS 411

16 4,291,608
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53 4,292,011
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CLASS 418

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24 4,292,280
27 4,292,281
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223 4,292,286
241 4,292,287
247 4,292,288
301 4,292,289
336 4,292,290
450 4,292,291
477 4,292,292
571 4,292,293
594 4,292,294
625 4,292,295

CLASS 424

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10 4,292,298
16 4,292,299
19 4,292,300
28 4,292,301
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4,292,303
37 4,292,304
45 4,292,305
52 4,292,306
92 4,292,307
98 4,292,308
119 4,292,309
122 4,292,310
162 4,292,311
176 4,292,312
177 4,292,313
182 4,292,314
240 4,292,315
248.56 4,292,316
250 4,292,317
4,292,318
4,292,319
258 4,292,320
267 4,292,321
274 4,292,322
4,292,323
289 4,292,324
304 4,292,325
317 4,292,326
325 4,292,327

CLASS 425

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73 4,292,015
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144 4,292,018
325 4,292,019

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5 4,292,329
20 4,292,330
52 4,292,331
111 4,292,332
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447 4,292,334
489 4,292,335
548 4,292,336
573 4,292,337
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650 4,292,339

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385.5 4,292,350
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593 4,292,375
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CLASS 429

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197 4,292,382
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275 4,292,393
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299 4,292,395
302 4,292,396
303 4,292,397
306 4,292,398
338 4,292,399
383 4,292,400
393 4,292,401
631 4,292,402

CLASS 431

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170 4,292,022
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CLASS 432

13 4,292,024

CLASS 433

18 4,292,025
69 4,292,026
127 4,292,027
180 4,292,028
228 4,292,029

CLASS 434

262 4,292,030

CLASS 435

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18 4,292,404
31 4,292,405
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161 4,292,407
173 4,292,408
288 4,292,409

CLASS 455

12 4,292,685
194 4,292,686

CLASS 474

18 4,292,031

CLASS 493

43 4,292,032
92 4,292,034
221 4,292,033

CLASS 501

4 4,292,080
96 4,292,081
100 4,292,082
104 4,292,083
107 4,292,084

CLASS 518

714 4,292,410

CLASS 521

51 4,292,411
107 4,292,412
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CLASS 525

255 4,292,414
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510 4,292,417
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CLASS 526

192 4,292,419
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CLASS 528

15 4,292,422
18 4,292,423
500 4,292,424

CLASS 536

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CLASS 544

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021 4,292,427

CLASS 546

278 4,292,429

CLASS 548

206 4,292,430
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CLASS 549

35 4,292,432

CLASS 556

479 4,292,433
4,292,434

CLASS 560

96 4,292,435
148 4,292,436
233 4,292,437

CLASS 562

503 4,292,438
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CLASS 564

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CLASS 568

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456 4,292,448
649 4,292,449
788 4,292,450
863 4,292,451
881 4,292,452

CLASS 570

193 4,292,453

CLASS 585

16 4,292,454
320 4,292,455
431 4,292,456
447 4,292,457
469 4,292,458
641 4,292,459

CLASSIFICATION OF DESIGNS

D2—	343	260,945		355	260,967		5	260,988		49	261,009		72	261,030		29	261,051
		260,946		428	260,968		12	260,989		51	261,010		163	261,031		46	261,052
D3—	71	260,947		439	260,969		53	260,991		90	261,011	D24—	12	261,032		66	261,053
		260,948	D10—	39	260,970			260,992	D20—	10	261,012		17	261,033			261,054
D4—	35	260,949		50	260,971		70	260,993		42	261,013			261,034			261,055
D6—	73	260,950		70	260,972		105	260,990	D21—	27	261,014	D25—	22	261,035		85	261,056
	79	260,951		91	260,973	D15—	9.1	260,994		35	261,015			261,036		93	261,057
	86	260,952		101	260,974		70	260,995		84	261,016			261,037			261,058
	104	260,953		106	260,975		116	260,996		142	261,017			261,038			261,059
	177	260,954		114	260,976	D16—	06	260,997		143	261,018			261,039			261,060
	186	260,955	D11—	4	260,977		14	260,998			261,019			261,040		134	261,061
D7—	38	260,956		158	260,978		28	260,999		150	261,020			261,041	D27—	36	261,062
	60	260,957		160	260,979		42	261,000		196	261,021			261,042	D28—	44	261,063
	94	260,958		162	260,980		48	261,001		227	261,022		32	261,043	D32—	49	260,959
D8—	1	260,960	D12—	14	260,981	D18—	1	261,002		239	261,023		33	261,044	D59—	2 B	261,064
	107	260,961		114	260,982		4	261,003	D22—	1	261,024		74	261,045	D92—	1 C	261,067
	359	260,962		180	260,983			261,004		18	261,025			261,046		1 E	261,066
	360	260,963		209	260,984		7	261,005	D23—	2	261,026		91	261,047		1 R	261,065
	373	260,964	D13—	30	260,985		15	261,006		32	261,027	D26—	24	261,048	D99—	25	261,068
		260,965		99	260,986		26	261,007		58	261,028		26	261,049		44	261,069
D9—	349	260,966	D14—	2	260,987	D19—	32	261,008		71	261,029			261,050			

CLASSIFICATION OF PLANTS

P.—	7	4,769		47	4,770			4,771						

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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